NORTH CAROLINA Medical Journal

Vol. 13 No. 3
March, 1952

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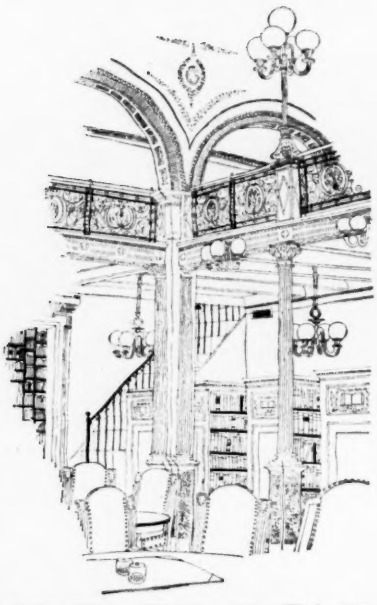

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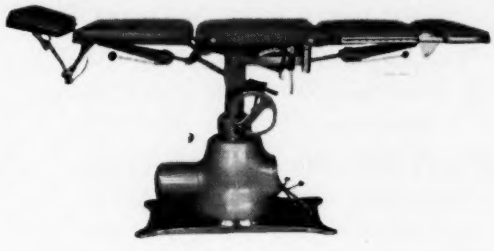

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NORTH CAROLINA MEDICAL JOURNAL

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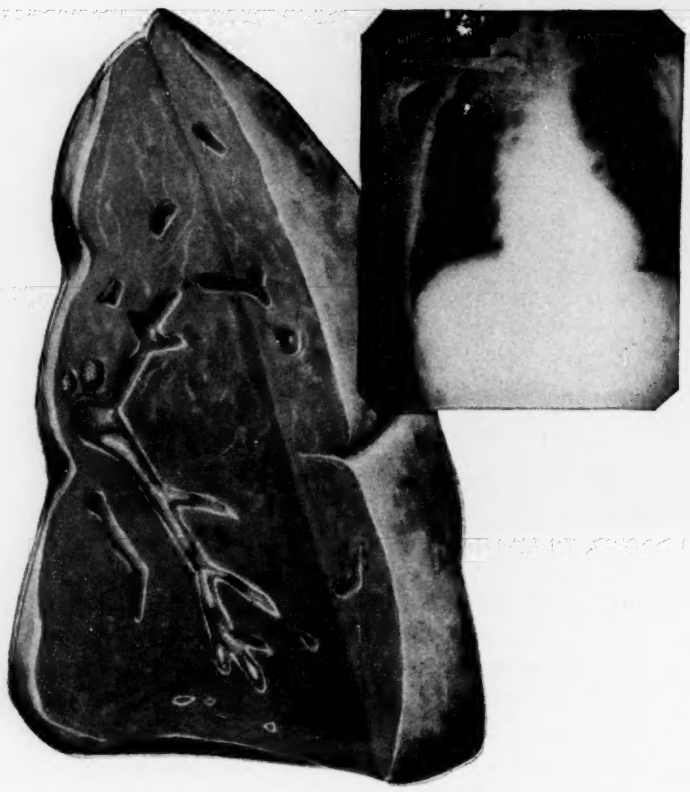

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Graves, F. B., and Ball, W. O.: J. Pediat. 39:155 (Aug.) 1951

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GRAM-POSITIVE BACTERIAL INFECTIONS

Lobar pneumonia • Mixed bacterial pneumonias
Bacteremia and septicemia
Acute follicular tonsillitis
Septic sore throat • Pharyngitis
Acute and chronic otitis media
Acute bronchitis • Laryngotracheitis
Tracheobronchitis • Sinusitis
Chronic bronchiectasis
Pulmonary infections associated with pancreatic insufficiency
Scarlet fever • Urinary tract infections
Acute and subacute purulent conjunctivitis
Acute catarrhal conjunctivitis
Chronic blepharoconjunctivitis not involving the meibomian gland
Abscesses • Cellulitis
Furunculosis • Impetigo
Infections secondary to Acne vulgaris
Erysipelas • Peritonitis

GRAM-NEGATIVE BACTERIAL INFECTIONS

Gonorrhea • Brucellosis
Bacteremia and septicemia
Friedländer's pneumonia
Mixed bacterial pneumonias
Pertussis • Diffuse bronchopneumonia
Post-partum endometritis • Granuloma inguinale
Dysentery • Urinary tract infections
Respiratory tract infections
Cellulitis • Peritonitis • Tularemia

SPIROCHETAL INFECTIONS

Syphilis • Yaws • Vincent's infection

RICKETTSIAL INFECTIONS

Epidemic typhus • Murine typhus
Scrub typhus • Rickettsialpox
Q fever • Rocky Mountain spotted fever

VIRAL INFECTIONS

Primary atypical pneumonia (virus pneumonia)
Lymphogranuloma venereum • Trachoma

PROTOZOAL INFECTIONS

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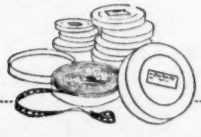

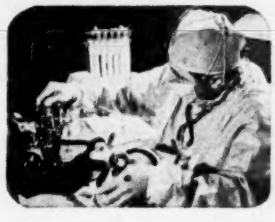

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**J. Pediat. 39:325, 1951*

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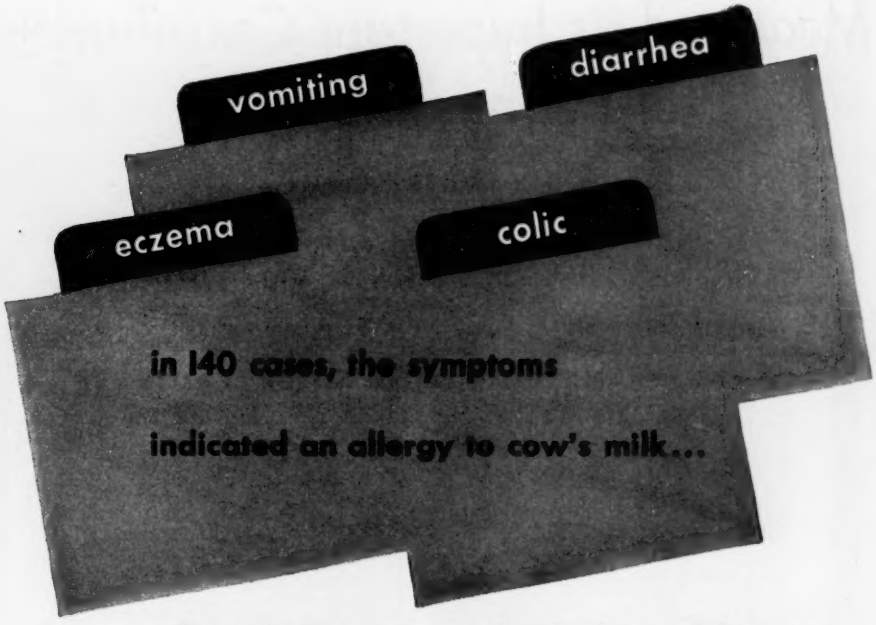

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*Clein, Norman W.: Cow's Milk Allergy in Infants, Ann. Allergy 9:195 (March-April) 1951.

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200 Gm. (approx. 7 oz.),[1] Edible Portion (Uncooked)

	Beef Round	Lamb Leg	Pork Loin	Veal Shoulder
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Calcium[3]	22 mg.	20 mg.	20 mg.	22 mg.
Chlorine[2]	147 mg.	136 mg.	125 mg.	147 mg.
Copper[3]	0.2 mg.	0.2 mg.	0.2 mg.	0.2 mg.
*Iodine[4] (Ohio animals)	0.02 mg.	0.03 mg.	Data not available	0.01 mg.
Iron[3]	5.8 mg.	5.4 mg.	5.0 mg.	5.8 mg.
Magnesium[3]	46 mg.	42 mg.	39 mg.	46 mg.
Phosphorus[3]	360 mg.	426 mg.	372 mg.	398 mg.
Potassium[3]	661 mg.	610 mg.	559 mg.	661 mg.
Sodium[3]	164 mg.	152 mg.	139 mg.	164 mg.
†Cobalt[5]	0.0002 mg.	———	Data not yet available	———
†Manganese[3]	0.03 mg.	0.03 mg.	0.02 mg.	0.03 mg.
†Zinc[5]	9.4 mg.	———	Data not yet available	———

*Iodine content of meat varies with the iodine content of feed of the animals.
†Needed in trace amounts only.

The average values for iron, phosphorus, and copper of the four kinds of meat shown constitute about 46, 25, and 100 per cent, respectively, of the National Research Council's recommended daily allowances for adults, and the average values for chlorine, potassium, and sodium constitute about 14, 63, and 16 per cent, respectively, of the estimated daily adult needs, as based on mineral balance studies.[6] Although no specific information is available on the quantitative needs for cobalt, magnesium, manganese, and zinc, nutrition information would suggest that the amounts reported above have nutritional importance or significance.

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1. Recent estimates of the U. S. Department of Agriculture indicate that the per capita consumption of meat in the United States approaches seven ounces per day.
2. Watt, B. K., and Merrill, A. L.: Composition of Foods—Raw, Processed, Prepared, In Agriculture Handbook No. 8, United States Department of Agriculture, 1950.
3. Estimated on basis of protein content of meats. Sherman, H. C.: Food Products, ed. 4, New York, The Macmillan Company, 1948, p. 155.
4. Ohio animals; varies with iodine content of feed. Johnson, H. J.: Bridges' Dietetics for the Clinician, ed. 5, Philadelphia, Lea & Febiger, 1949, p. 800.
5. Mitteldorf, A. J., and Landon, D. O.: Analytical Chemistry; Spectrochemical Analysis of Beef for Mineral-Element Content, Armour Research Foundation of Illinois Institute of Technology. In Press.
6. Dauphinee, J. A.: Sodium, Potassium, and Chloride Malnutrition, Including Water Balance and Shock, in Jolliffe, N.; Tisdall, F. F., and Cannon, P. R.: Clinical Nutrition, New York, Paul B. Hoeber, Inc., 1950, p. 341.

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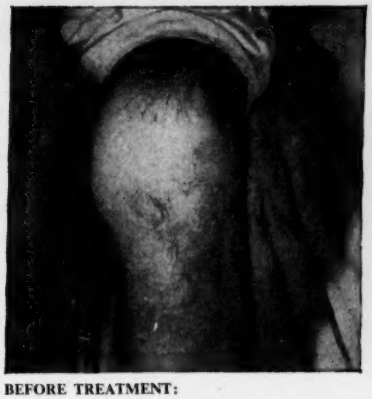
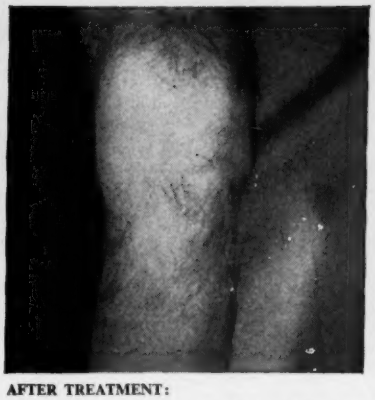


BEFORE TREATMENT:
Periarticular swelling and hydrarthrosis



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Ward, L. E., Slocumb, C. H., Polley, H. F., Lowman, E. W., and Hench, P. S.: *Proc. Staff Mtgs., Mayo Clinic* 26: 361, September 26, 1951.

Literature on Request

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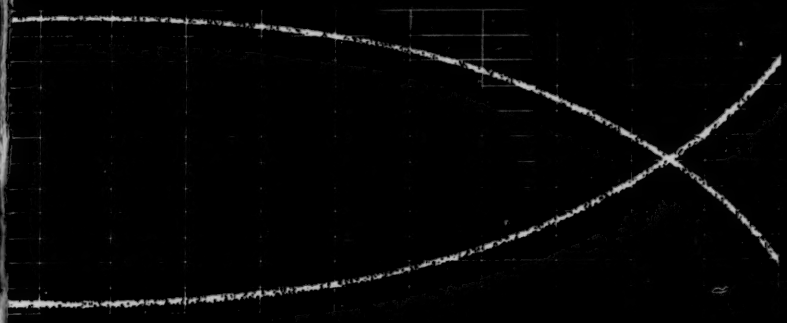

demand

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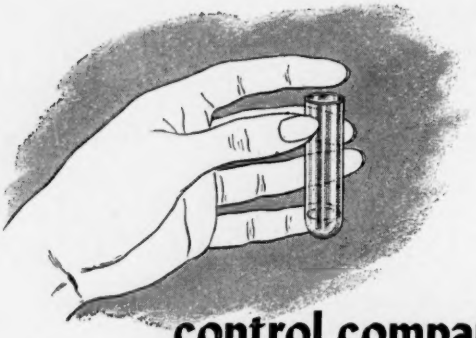

control companion to ACTH and CORTISONE

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Sprague, R. G.: Cortisone and ACTH, Am. J. Med. *10*:567, 1951.

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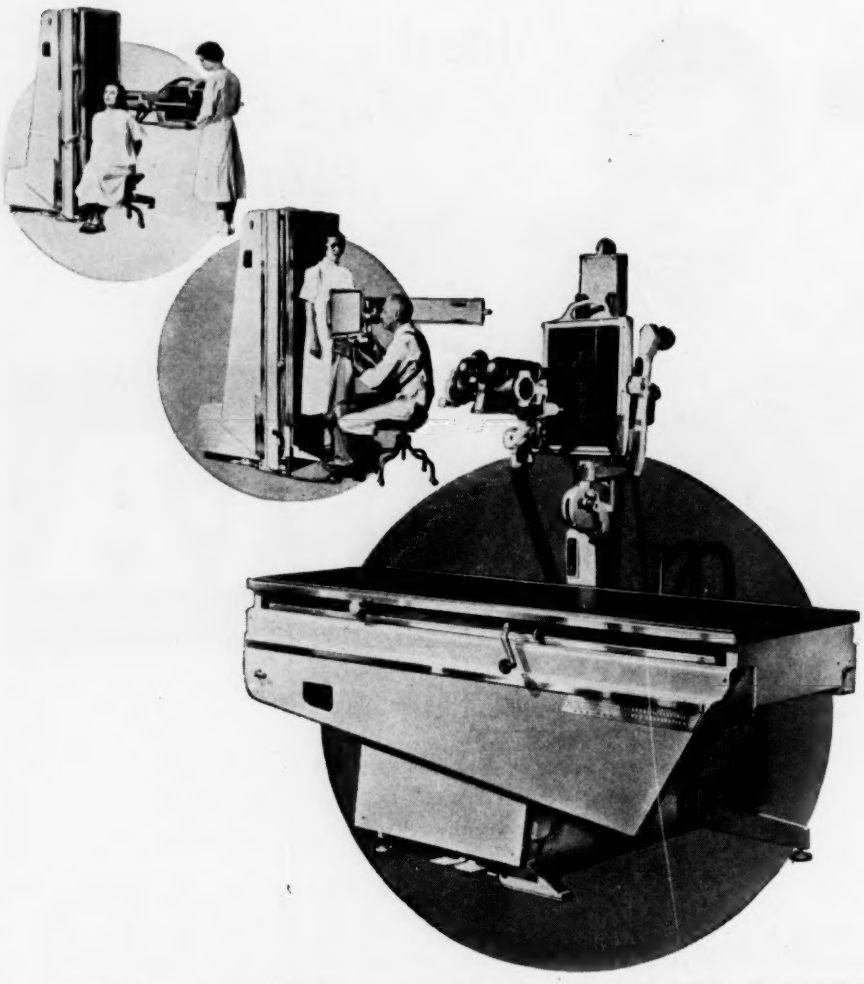

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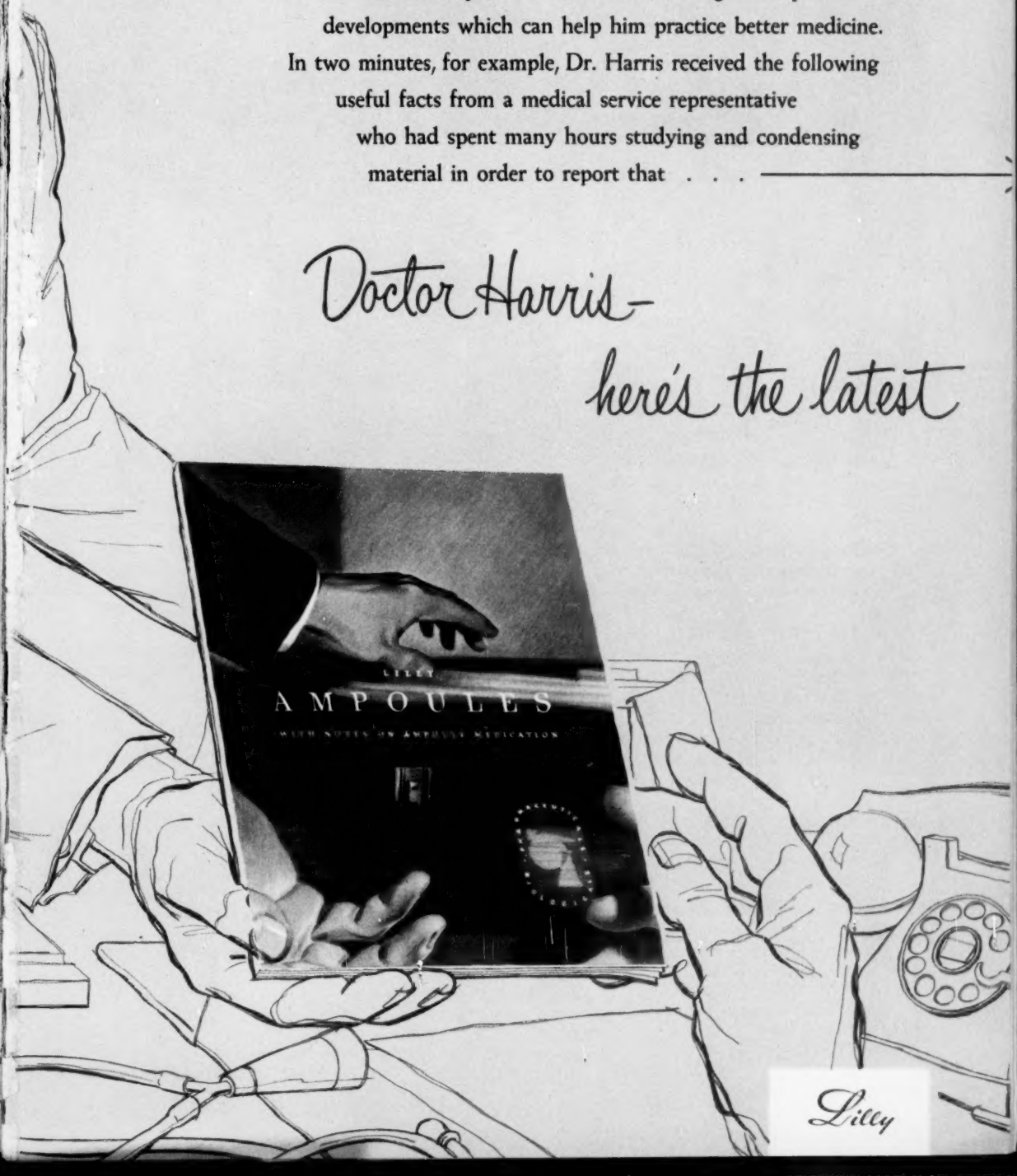

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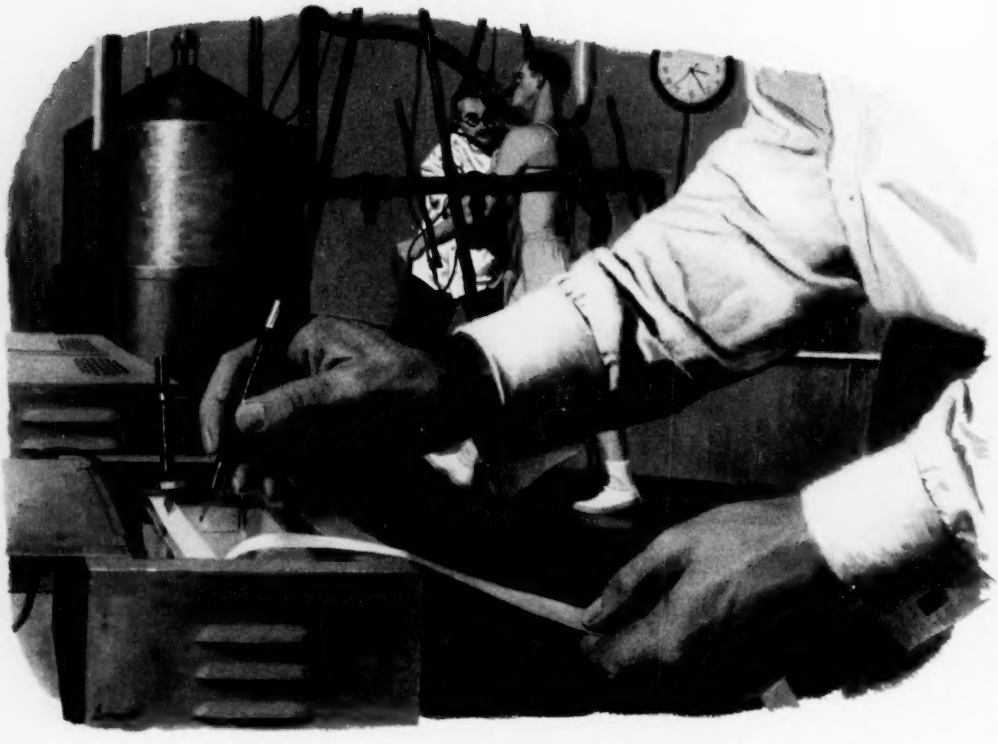

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SYMPOSIUM ON PREMATURITY

THE PROPHYLACTIC TREATMENT OF PREMATURITY*

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and
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DURHAM

The prevention of premature births is an important factor in the problem of reducing neonatal mortality over the coming years. Any review of the rather voluminous literature on prematurity reveals that it accounts for more than 50 per cent of the neonatal deaths. Although there has been a gradual decline in the neonatal death rate over the years, this decrease has been greater in the term-infant group than in the premature group (fig. 1). Better facilities in modern centers for the care of premature infants and such advances in therapeusis as the antibiotics will lead to further reduction. However, a minimum point will soon be reached beyond which it will be difficult further to reduce premature deaths on these bases alone.

General Factors in Prematurity

Dunham[1] has found (fig. 2) that 57 per cent of the deaths in premature infants occur in the first 24 hours following delivery, and that another 33 per cent occur in the remainder of the first postnatal week. In general, factors which are operative in this high early mortality are the initial birth weight of the infant and obstetric complications.

In figure 3, Dunham[1] shows that in the group of neonatal deaths occurring under one month, prematurity alone was assigned as the major cause of death in 49 per cent of the cases. Other infants in this group may have been premature, but in infants with birth injury and congenital malformation this was only a contributing cause.

Douglas[2], in a survey from Great Britain, showed that 86 per cent of the babies weighing 2½ pounds or less died; 69.5 per cent from 2½ to 3½ pounds; 24.6 per cent from 3½ to 4½ pounds; 8.43 per cent from 4½ to 5½ pounds; and 2 per cent from 5½ to 6½ pounds. Brockway, Reilly and Rice[3], in a similar analysis, revealed a mortality of 87.5 per cent in those weighing less than 1000 Gm.; 35.5 per cent in the 1000 to 1500 Gm. weight group; 13.5 per cent in the 1500-2000 Gm. group; and 0.3 per cent in the 2000-2500 Gm. group. Both these studies suggest that each week of maturity materially increases the prognosis of the premature child.

As previously mentioned, however, birth weight is not the only responsible factor in premature mortality; obstetric complications in the mother are of great import. Taylor, Phalen, and Dyer[4] illustrated this point well. The total per cent of fetal loss was more than twice as high in each weight group of infants when the mother's pregnancy was complicated. Tyson[5], in a 15 year study of prematurity at Philadelphia Lying-In Hospital, felt that the two most important complications were toxemia of pregnancy, which resulted in a mortality rate of 37 per cent in all prematures born of toxic mothers, and placental and cord complications leading to a 63 per cent death rate. (This included all babies, stillborn and live-born.)

In general, the percentage of prematurity reported in the literature varied. Pomerance and Steiner[6] reported 4.3 per cent (only babies weighing less than 2250 Gm. were included), Dougles[2] 7 per cent, Tyson[5] 9.4 per cent, Taylor and others[4] 13.3 per cent, Brockway[3] and others over 15 per cent. In an analysis of figures from 1946 through

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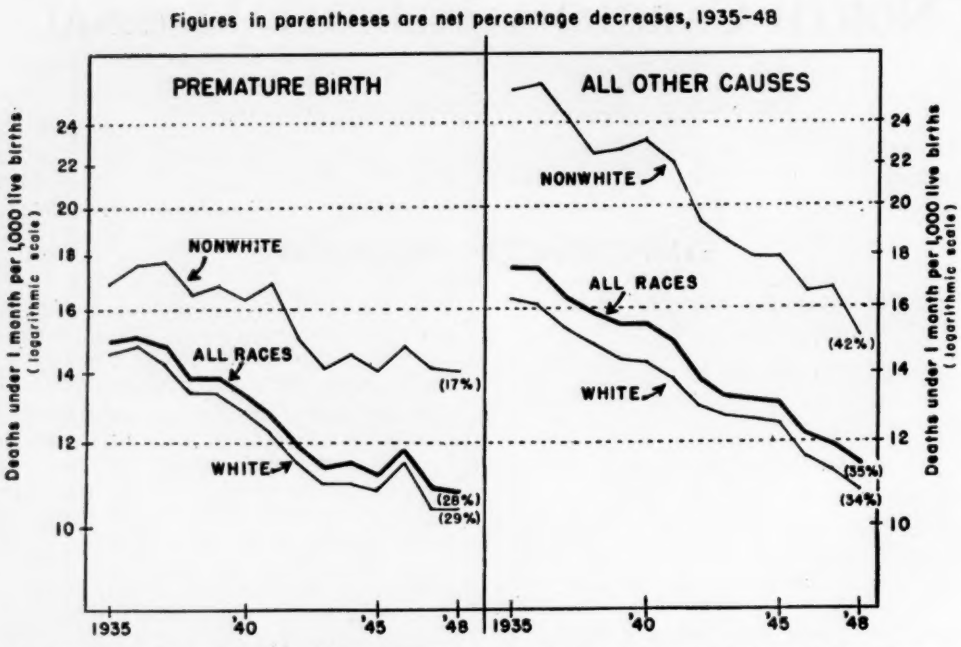

Fig. 1. Neonatal mortality rates from premature birth and all other causes, by race: United States, 1935-1948 (National Office of Vital Statistics).

1950 at Duke Hospital (tables 1, 2, and 3), the percentage of prematurity was 10.4, and neonatal mortality in these infants 20.3 per cent, accounting for 76.5 per cent of the total neonatal mortality. It is interesting to note that over the years there has been very little fluctuation in the incidence of premature birth. This fact was noted by Tyson[5] also.

With these above facts in mind, we might inquire into some of the possible causes of premature delivery, with the thought that knowing these we can more intelligently aim at a program for prevention of early premature delivery.

Causes of Prematurity

Sociologic factors

Race seems to affect the incidence of prematurity. Premature birth is higher in the Negro race than in the white (Dunham[1], Brockway, Reilly and Rice[3], Pomerance and Steiner[6]). These and other authors believe that this is because Negro babies weigh less at the same maturity level than white babies. They show that if 2250-2350 Gm. be accepted as the maximum weight for Negro

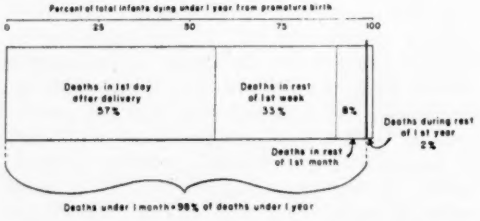
Percent of total infants dying under 1 year from premature birth
0
25
50
75
100
Deaths in 1st day after delivery 57%
Deaths in rest of 1st week 33%
8%
Deaths during rest of 1st year 2%
Deaths in rest of 1st month
Deaths under 1 month = 98% of deaths under 1 year

Fig. 2. Distribution of causes of death under 1 month: United States, 1948.

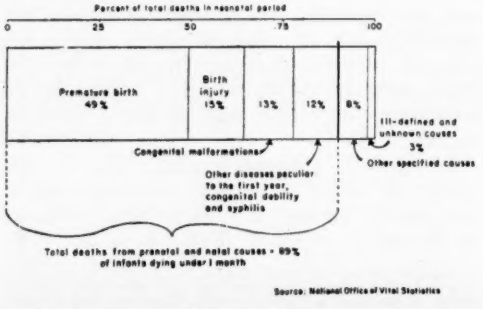

Fig. 3. Age distribution of deaths under 1 year from premature birth: United States, 1948.

Table 1

Deliveries at Duke Hospital, 1946-1950, with Distribution of Stillborns, Neonatal Deaths, and Total Fetal Loss.

YEAR	STILLBORNS		NEONATAL DEATHS		TOTAL DEATHS		TOTAL FETAL LOSS
	Term	*Premature*	*Term*	*Premature*	*Term*	*Premature*	
1946	15	29	6	30	21	59	80
1947	14	38	10	20	24	58	82
1948	24	44	6	23	30	67	97
1949	19	28	10	25	29	53	82
1950	26	38	4	19	30	57	87
TOTAL	98	177	36	117	134	294	428

babies, the incidence of prematurity is about the same.

Occupation: Douglas[2], in his exhaustive study of prematurity, found a lower incidence of premature birth in the wives of professional and salaried workers as compared to the wives of wage-earners and manual workers. However, Tyson[5], in his 15 year study, noted that in spite of the marked shift from ward to private patients and the higher incidence among white patients, the incidence of prematurity remained essentially unchanged.

Primiparity and maternal age: Douglas[2] noted that the risk of prematurity was greatest among primiparas (8.3 per cent as against 5.6 per cent for subsequent pregnancies). This seems to be a general finding. The age of the mother apparently plays a part in this picture. Douglas[2] felt that from 26 to 30 years was the best age at which to have a first baby; the least favorable age was 20 years or younger. Waters and Wager[7a], in a study of primaparas over 35 years of age, noted that premature delivery occurred more frequently in these women than in a similar number of primiparas below the age of 25 years. Marchetti and Menaker[7b], in a study of young primigravidas from the age of 12 through 16 years, noted a higher incidence of prematurity in this group.

In considering the *interval between pregnancies*, Douglas[2] noted that, whatever the mother's age, the incidence of prematurity was consistently high with birth intervals of two years or less (table 4). The lowest incidence of prematurity occurred in the 26 to 35 year age group, when pregnancies were spaced not less than 2 or more than 6 years previously.

Prenatal care seems to be an important factor in the prevention of prematurity.

Table 2

Deliveries at Duke Hospital, 1946-1950, with Distribution of Premature Infants.

Year	*Total Deliveries*	*Term*	*No. Premature Infants*	*Incidence of Prematurity*
1946	1434	1279	155	10.8
1947	1511	1379	132	8.7
1948	1430	1264	166	11.5
1949	1426	1273	153	10.7
1950	1441	1292	149	10.3
TOTAL	7242	6487	755	10.4

Table 3

Percent of Prematurity, Stillborn, Premature and Neonatal Deaths at Duke Hospital, 1946-1950

Incidence Prematurity, 1946-1950 (5 years)—10.4 per cent

Total Fetal Loss—5.9 per cent (in 7,242 deliveries)

- Percentage stillborns—3.8 per cent
- Percentage neonatal deaths—2.1 per cent
- Percentage premature deaths—4.1 per cent
- Percentage term deaths—1.8 per cent

Total Fetal Deaths—428, 294 premature or 68.6 per cent

Total live-born infants—6,967

Total live-born prematures—578, 117 died or 20.3 per cent

Total live-born term—6,389, 36 died or 0.56 per cent

Total neonatal deaths—153, 117 premature or 76.5 per cent

Table 4

Incidence of Prematurity as Related to Pregnancy Spacing (Based on data by Douglas[2]).

Years	Premature (Per Cent)
1 or less	19.3
1-2	6.4
2-3	4.8
3-4	4.1
4-6	4.0
Over 6	6.5

Douglas[2] showed that the incidence of prematurity was almost twice as high in women who had received inadequate prenatal care as in those whose care was adequate (10.5 per cent and 5.8 per cent in first pregnancies; 9.3 per cent and 3.5 per cent in subsequent pregnancies). He also noted an increased incidence of prematurity in women who worked. This was 13.7 per cent in those who worked until 11 weeks or less before delivery, and 6.0 per cent in those who stopped 20 or more weeks prior. Tyson[5] noted that in 1930 only 40 per cent of patients fulfilled the minimum requirements for prenatal care (4 visits), whereas over 90 per cent did in 1944, with little influence on the number of premature infants but an increasing number of big premature infants, and a decreasing number of babies under 1000 Gm.

Diet: Tyson[5] noted that improvement of dietary intake by large amounts of proteins, vitamins, and minerals in 750 pregnant

women resulted in not a single premature delivery in this group, whereas 37 premature deliveries occurred in a similar group of patients not on a diet. Burke[8a] found an increased incidence of prematurity in women on protein-poor diets. Similar findings were noted by Smith[8b] in Holland, and Ebbs, Tisdall, and Scott[8c].

Obstetric complications

Pomerance and Steiner[6] noted that complications of pregnancy were present in 46.5 per cent of women going into premature labor; Bookstaver[9] noted complications in 49.2 per cent; Taylor[4] and others in 28 per cent.

Toxemia: Pomerance and Steiner[6,10], in two reports, stated that toxemia of pregnancy was the most common maternal complication noted in the group of premature infants. Table 5 shows the incidence of complications as noted by Bookstaver[9] and Tyson[5].

Toxemia of pregnancy is generally regarded as the most common maternal complications noted in premature labor[11]. Hamilton, Jeffcoate, and Lester[12], in a study of fetal mortality in toxemia, stated that the factors chiefly concerned in deaths of infants born of toxemic mothers were prematurity and immaturity. The placenta was often found to be small and its blood vessels and circulation damaged to some extent, with resulting fetal anoxemia, leading to stillbirth and premature delivery. They noted a fetal loss of 13 per cent in pre-eclampsia, 25 per cent in chronic hypertension, 27 per cent in nephritic toxemia, and 48 per cent in hypertension. The greater number of deaths in this group was stillborns.

Pomerance and Steiner[10], in a special study on the influence of toxemia, noted that it was the factor responsible for the highest incidence of stillbirths (only 14.6 per cent born alive at 33 weeks or less), but that those premature infants born alive had a fatality rate of 8.3 per cent. Figures in the same weight group were comparable in babies born alive of toxemic and non-toxemic mothers. The fatality rate of infants born of toxemic mothers from 34 to 37 weeks equalled that of babies born between 37 and 40 weeks.

Chesley and Annetto[13] showed that the higher the initial pressure in toxemia, the greater the fetal mortality.

Table 5
Incidence of Maternal Complications as Related To Premature Delivery

	Toxemia of Pregnancy	*Multiple Pregnancy*	*Premature Separation Placenta*	*Placenta Previa*	*Cord and Placental Defects*	*Others*	*Syphilis*
Bookstaver[9]	13.4	12.3	4.6	3.2		5.6	
Tyson[5]	13.0	13.6	4.7	2.7	7.7		7
Hawkins & Merkel[11]	12.6						
Pomerance & Steiner[10]	20.0						

Premature separation of the normally implanted placenta was found to occur in 4.5 to 5.0 per cent of the mothers giving birth to premature infants. This condition is often associated with toxemia, and this association was found by Sexton, Hertig[14], and others, to increase fetal loss nearly five times that of toxemia alone.

Placenta previa occurs in about 3 per cent of mothers delivering premature babies. Williams[15], in a survey of the literature, noted fetal mortality rates varying from 23 to 46.8 per cent. This mortality rate was reduced to 10 per cent in babies of 74 women who did not have bleeding until term or close to term. A similar reduction was found by Johnson[16a,b] following conservative therapy.

Syphilis has become less and less commonly a cause of premature delivery and stillbirth. This is due to improved methods of treatment and a better public health program.

The Rh factor is absent in a slightly higher percentage of women with recurrent abortion than in women going to term according to Hunt[17]. When sensitization is present, premature delivery and stillbirth are common.

Diabetes leads to an increased incidence of prematurity and stillbirths.

Other factors

There are many women delivered prematurely in whom no particular complication is noted (approximately 50 per cent). Some of the factors mentioned under sociologic factors may have some bearing on this problem.

We enter into the theoretical realm when we try to deduce the cause of all these premature deliveries. Certain patients undoubtedly have some inadequacy of the placenta with a reduction in the placental hormones, leading to premature delivery. Ovular defects account for some premature deliveries,

as in the case of anencephalic monsters and other gross abnormalities frequently delivered prior to maturity.

Premature rupture of the membranes in the absence of abnormalities is difficult to explain. Knox and Hoerner[18] theorize that an infectious process in the cervical canal might extend to the overlying membranes, producing inflamed and friable membranes which might give way under strong Braxton-Hicks contractions or other strain. They showed pathologic changes with acute and chronic inflammation in prematurely ruptured membranes.

Prevention of Prematurity

Sociologic factors

The important answer to most of these causes of prematurity—increased incidence in primiparas, mothers under 20 years of age, and those with inadequate prenatal care —can be stated simply: *more* and *better* prenatal care, with special emphasis on this particular group of patients. Planned pregnancies, with better contraceptive advice in the lower income group, will help to reduce the higher prematurity rate resulting from too rapidly recurring pregnancies. Better dietary advice, with social agency support of protein and mineral supplements for patients unable to afford them may be of help. We should like to suggest further support of laboratories investigating toxemia of pregnancy and of laboratories doing general clinical work among underprivileged patients.

Obstetric factors

The lowering of the incidence of toxemia of pregnancy will greatly reduce prematurity. Prevention of toxemia is not always possible, but its occurrence is minimal in private patients with good prenatal supervision, dietary intake, and limited weight gain. This we should strive for in all patients.

Premature separation of the placenta will decrease with the decreasing incidence of toxemia of pregnancy. However, it seems unlikely that this will ever be an entirely preventable accident. Some patients with a minimal separation and bleeding can be treated conservatively, with the realization that each increased week of pregnancy materially increases the infant's chance for life.

Placenta previa is not preventable, but its expectant treatment in many clinics in the recent years has resulted in a marked decrease in fetal and neonatal mortality because of the increased size of infants delivered. This has been done without materially increasing maternal mortality. However, this expectant treatment, in our opinion, should involve hospitalization during this period, in a medical center with emergency facilities.

Better control of the diabetic patients, with the added use of steroid hormones as advised in some clinics, has resulted in a decrease in premature deliveries and stillbirths in this group of patients.

Treatment

A great deal has been said pro and con regarding the treatment of patients who habitually lose late pregnancies or deliver prematurely.

Smith and Smith[19], in a study of normal primaparas treated during pregnancy with diethylstilbestrol as compared to a similar group of primiparas who were untreated, noted a lower incidence of prematurity in the treated patients. Those premature infants born to the treated patients were unusually large and mature for their gestational ages. In another study[20] of 180 women who were treated with stilbestrol for the late pregnancy complications, 76 women had had spontaneous premature delivery in 83 per cent of their previous pregnancies. Despite the administration of stilbestrol, 49 per cent again delivered prematurely, but the pregnancies were generally carried longer and the infants were larger and more mature for their gestational periods, thus reducing fetal mortality from 77 per cent to 20 per cent. Davis and Fugo[21], administering large doses of intramuscular progesterone (up to 50 mg. oil per day) in one group of patients with repeated pregnancy wastage, and large doses of diethylstilbestrol in another group used as a control, demonstrated a 66.7 per cent salvage in the progesterone group and a 45.2 per cent salvage in the stilbesterol group. Echner and Kunin[22], in a bestrol group, Echner and Kunin[22], in a ruptured membranes, were able to extend pregnancy in 5 of 14 patients from 2 to 10 weeks after rupture by very large doses of progesterone given intramuscularly. This therapy apparently is of little value if the patient is in active labor.

Summary

The incidence of premature delivery apparently varies from 4.8 to 15 per cent. This rate has changed little over the years. This

small group of babies accounts for at least half of the neonatal mortality. Any great reduction in neonatal mortality must mean a decrease in the incidence of premature deliveries.

Primiparity, especially in young women, too early repetition of pregnancies, inadequate prenatal care and dietary intake are accompanied by an increase in premature delivery.

Obstetric complications such as toxemia of pregnancy, premature separation of the placenta, and placenta previa are common causes of premature delivery. These complications at least double the fetal and neonatal mortality in premature delivery.

Unexplained premature rupture of the membranes and inadequate placental output of gonadotrophins and steroid hormones are causes of premature delivery in some patients.

Conclusions

1. Improved prenatal care seems to be a must if there is to be any reduction in premature deliveries. This is especially true in young primiparas, in women with too frequently repeated pregnancies, and in those with a history of toxemia. Better prenatal care is also necessary if the incidence of toxemia of pregnancy is to be decreased.

2. Premature separation of the placenta will be decreased with a decrease in toxemia. It may be managed conservatively at times. Placenta previa is not preventable, but can be treated conservatively in some patients under hospital conditions, with the prolongation of pregnancy.

3. Diethylstilbestrol apparently increases the maturity and size of the fetus, and has decreased fetal mortality rate in some clinics. Progesterone administered intramuscularly in large doses has increased fetal salvage in poor risk patients, and prolonged pregnancy in some instances of premature rupture of the membranes.

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Maintaining health: Many patients will accept treatment, placing all responsibility on the doctor, but shudder at the idea of any moderation on their part. The low value placed on health until sickness comes is astonishing, and some people even then hesitate to pay the necessary price for it. Surely, in the troubled days in which we live, health is all the more precious because so many things have fallen in value. You cannot devalue health. — Sir John Parkinson: The Patient and the Physician, Ann. Int. Med. 35:309 (Aug.) 1951.

Silence is golden, but not always in physicians, whose silence may often do far more harm than speech. Silence gives consent, and it may be consent to the fears universally felt by people who are ill. Put yourself in the patient's place—some day you may have to. Patients resent the omission of any clear statement of what is the matter and what should be done about it, and they go away and say, "My doctor told me nothing." There are constant complaints that a physician does not fully and fairly express his opinion and advice at the end of a consultation. This is every patient's due; the formal and technical report should be for his doctor.—Sir John Parkinson: The Patient and the Physician, Ann. Int. Med. 35:312 (Aug.) 1951.

THE MANAGEMENT OF LABOR AND DELIVERY IN THE INTEREST OF THE PREMATURE INFANT

DONALD L. WHITENER, M.D.

WINSTON-SALEM

In view of the vastly improved nursing and pediatric care available to the newborn infant, it behooves the physician practicing obstetrics to re-examine periodically his responsibility for the welfare of the premature infant. Statistically, one out of every 20 infants is delivered prematurely; yet over one half of the neonatal deaths in liveborn infants occur in premature infants. In the North Carolina Baptist Hospital, during the past seven years, the incidence of prematurity has been 6 per cent, but 77 per cent of the total neonatal deaths occurred in this group. Enlightened obstetric management combined with proper neonatal care should cause a reduction in premature mortality with a significant effect on total infant salvage.

Material

The records of 458 consecutive premature deliveries at the North Carolina Baptist Hospital, from 1944 to 1950, were reviewed in an effort to isolate the factors which might affect the survival of the infant. In 29 instances of twin pregnancy, both infants were premature; therefore, a total of 487 babies were included in this study. Infants weighing less than one pound, or 454 Gm., were not included.

Condition of the Infant at Birth

In the first general review of these cases, it was apparent that a direct relationship existed between the condition of the baby at the time of delivery and its chance for survival. When the infants are divided into the two weight groups of more than 4 pounds and less than 4 pounds, the mortality rates are considerably higher among those infants who, for one reason or another, were in poor condition at delivery (table 1). In the less than 4 pound group, the corrected mortality rate for infants in good condition was only 15.9 per cent; for those in poor condition the mortality was 49 per cent. Similarly, infants weighing more than 4 pounds who were delivered in satisfactory condition had a mortality rate comparable to that of term-size babies, whereas those in poor condition had a mortality rate of 10 per cent. In the group of nonpreventable deaths, we have listed only those due to congenital anomalies incompatible with life, diarrhea late in the neonatal period, erythroblastosis, and birth weight less than 1000 Gm.

Table 1

MORTALITY

	NUMBER OF INFANTS	TOTAL DEATHS	GROSS MORTALITY	NON-PREVENTABLE DEATHS	PREVENTABLE DEATHS	CORRECTED MORTALITY
UNDER 4 LBS.						
GOOD CONDITION	82	18	22.0%	5	13	15.9%
POOR CONDITION	55	47	85.5%	20	27	49.2%
TOTAL	137	65	47.4%	25	40	29.2%
OVER 4 LBS.						
GOOD CONDITION	313	10	3.2%	5	5	1.6%
POOR CONDITION	37	7	18.9%	3	4	10.8%
TOTAL	350	17	4.9%	8	9	2.6%
COMBINED TOTALS	487	82	16.8%	33	49	10.0%

Table 2

CAUSES OF DEATH

	GOOD CONDITION AT BIRTH		POOR CONDITION AT BIRTH		TOTAL
	OVER 4 LBS	UNDER 4 LBS	OVER 4 LBS	UNDER 4 LBS	
CONGENITAL ANOMALIES	2	2	2	0	6
INTRACRANIAL HEMORRHAGE	0	4	0	5	9
PNEUMONIA (ASPIRATION)	3	1	1	0	5
DIARRHEA	2	2	0	0	4
ERYTHROBLASTOSIS	1	0	0	0	1
SYPHILIS	0	0	0	1	1
NO DEMONSTRABLE PATHOLOGY (ATELECTASIS)	2 0	9 (3)	4 (3)	23 (7)	37 (13)
PREMATURITY (WEIGHT UNDER 1000 GMS)				19	19
TOTAL	10	18	7	47	82

In the 487 infants there were 82 deaths. The causes of death are shown in table 2. Congenital anomalies accounted for 6 deaths. Intracranial hemorrhage caused 9 deaths, with all fatalities occurring in the less than 4 pound weight group. Aspiration pneumonia affected the larger babies. Diarrhea caused 4 deaths; erythroblastosis 1; and syphilis 1. However, in 37 deaths (or 45 per cent of the total), there was no demonstrable cause of death other than atelectasis and prematurity. Improved obstetric and pediatric care in the future should reduce the number of deaths, particularly in this category.

It is well known that the survival of a premature infant is directly related to its size and weight at delivery. The percentage of infants surviving has been plotted for each ½ pound weight group, from 2 pounds to 5½ pounds (fig. 1.). There is a progressive increase in survival rates from 20 per cent for the smallest viable infants in the less than 2½ pound group, to a 99 per cent in the more than 5 pound babies. In addition, the infants in poor condition at delivery

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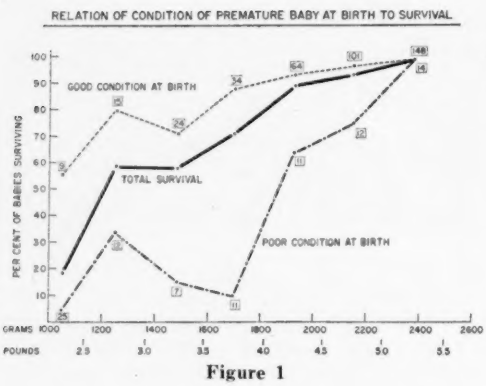

Figure 1

Table 3
COMPLICATIONS IN 458 PREMATURE LABORS

UNCOMPLICATED LABOR	159	35%
SPONTANEOUS RUPTURE OF MEMBRANES	137	30%
TOXEMIA	83	18%
HEMORRHAGE	72	16%
CONGENITAL ANOMALIES	23	5%
SYPHILIS	3	0.7%
TWIN PREGNANCY	47	10.2%
BOTH PREMATURE	29	6.3%

have been separated from those in good condition, and corresponding survival curves obtained. As is demonstrated, even the smallest infants have a good chance of growing to maturity when vigorous at delivery, while only the larger premature infants can overcome an initial depression which causes them to be listless and cyanotic at birth.

Complications of Pregnancy

It now becomes important to examine the factors influencing the condition of the infant at delivery. Complications of pregnancy, such as maternal bleeding and toxemia, certainly affect the condition of the infant, and thereby alter its prognosis.

In this series, toxemia occurred in 18 per cent of the cases, hemorrhage in 16 per cent, and syphilis in 0.7 per cent (table 3). Although the obstetrician cannot entirely prevent abnormalities, he must be prepared to treat each complication adequately, when it is recognized.

Toxemia of pregnancy, if properly managed, does not, however, alter the mortality for small infants, unless further complicated. In a recent study on the influence of toxemia on the fatality rate, Pomerance and Steiner, from the Jewish Hospital of Brooklyn, stated that they found no difference between the fatality rate of premature infants born to mothers with toxemia and that of premature infants born to mothers who had no toxemia. Their data also indicated that, from the standpoint of the fetus, it would not be necessary in cases of toxemia to carry pregnancy beyond the thirty-fourth week. The additional chance of placental separation or placental deterioration, if pregnancy is permitted to continue, cancels the advantage to the fetus of the extra ounces in weight it may attain.

In another study, these authors were able to prove, statistically, that spontaneous premature rupture of the membranes had no appreciable effect on fetal mortality when contrasted to late rupture of the membranes.

Maternal bleeding, however, does definitely alter the prognosis for the premature infant. Significant vaginal bleeding, with definite placental abnormality, occurred in 55 cases of this series. In 27 instances the infant was under 4 pounds in weight, and 17 of these infants were delivered in poor condition (only 10 in good condition). There was one death among those infants delivered in good condition (a 10 per cent mortality rate), but 14 neonatal deaths, or 82 per cent fetal mortality in those who were depressed, to some degree, at the time of delivery. There were 28 infants in the more than 4 pound group; 23 were delivered in satisfactory condition, with no fatalities, and 5 were delivered in poor condition, with one neonatal death. Antepartum bleeding increases the risk to the small premature infant by producing anoxia from damage to the placental circulation directly, or by causing a drop in maternal blood pressure.

Management

In order to salvage a greater number of premature infants whose mothers are affected by these complications, the responsible physician must recognize the premonitory signs and symptoms. One must treat the hypertensive and pre-eclamptic mothers promptly, so that the gestation may be carried to a point at which the fetus has the best chance for survival. In the presence of

hemorrhagic complications the maternal blood loss must be replaced in order to avoid fetal damage from shock. Conservative treatment, when possible, will yield a higher percentage of living children. Bed rest in the hospital, in a case of premature rupture of the membranes, will occasionally permit further time for growth of the fetus before spontaneous labor occurs. The problem of syphilis can be managed satisfactorily in the early prenatal period by the routine use of serologic tests for diagnosis.

Controllable Factors

There are, however, additional factors more directly controlled by the physician, which are likely to influence the condition, and, therefore, the survival of the infant. We must include in this category the amount of analgesia, the type of anesthetic, and the method of delivery used, as well as the immediate postnatal care of the infant. For that reason, the records of this group of 458 women were analyzed, to determine the influence of these factors on the condition of the baby and its ultimate survival.

Anesthetic and Analgesic Agents

It is impossible to differentiate the individual effects of the various anesthetic and analgesic agents in this series of patients, since combinations of agents were used in practically every case. However, the relative importance of the usual combinations of analgesic and anesthetic drugs can be determined. The patients who were given no anesthetic are included in the group which received a regional anesthetic in the form of local infiltration, or spinal or caudal anesthesia. The general anesthetic used most frequently was ether. Babies delivered with ethylene, cyclopropane, or with Sodium Pentothal given intravenously, were included in the group delivered under general anesthesia. The analgesic agents used included the usual barbiturates, as well as morphine, Demerol, and Pantopon. The total dosage of the drugs and the time of their administration in relation to delivery were found to be more important than the agent itself. For this reason, analgesia was estimated upon a basis of the total dosage and the time of administration, as follows:

1. No analgesia of significance was considered to have been used if only a moderate dose of one or more standard analgesic agents was given more than eight hours prior to the delivery of the child.

2. A patient was classified as receiving moderate analgesia when she received only one injection of morphine, 10 mg.; Demerol or potent barbiturate, 100 mg.; or a combination of one of these drugs with scopolamine, between the sixth and eighth hour prior to delivery.

3. The analgesia was considered heavy when larger doses of the drugs were used, when two or more analgesic drugs were administered, or when analgesics were given within six hours of the time of the patient's delivery.

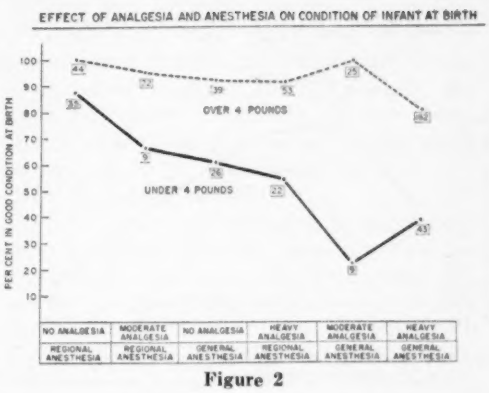

Figure 2

A graphic analysis of the effects of these various combinations of analgesic and anesthetic agents is shown in figure 2. Babies were divided into two major groups, consisting of those weighing more than 4 pounds, and those weighing less than 4 pounds.

It is clear that babies weighing more than 4 pounds can be delivered with excellent results if regional anesthesia is used, or if only moderate analgesia is combined with light inhalation anesthesia. A distinctly adverse effect upon the condition of the baby is shown in the group of patients who received heavy analgesia and general anesthesia. This result is indicated more clearly by the condition of the babies weighing less than 4 pounds; 87 per cent of the group of small babies delivered with regional anesthesia and no analgesia were vigorous and pink at the time of their delivery. The use of general anesthesia and increasing amounts of analgesia resulted in a progressive decrease in the number of babies in good condition. Only 40 per cent, or less, of the

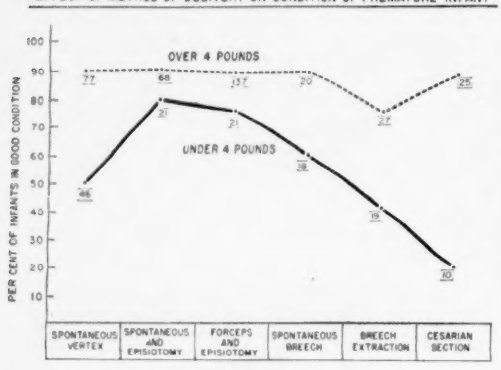

Figure 3

smaller babies were not depressed when a combination of heavy or moderate analgesia and general anesthesia were used.

Methods of Delivery

In order to compare the various methods of delivery, the series was again divided into more than 4 pound and less than 4 pound groups (fig. 3). Little difference is noted in the effect of the various methods of delivery upon the larger premature infants in a cephalic presentation. The poor result of breech presentation would be expected. Also, 90 per cent of the infants delivered by cesarean section were in good condition. In the less than 4 pound group, however, the use of the episiotomy yielded good results, as compared to the group of infants permitted to deliver spontaneously without the episiotomy. Poor results were obtained in the group of babies who were delivered from breech presentation, but the value of permitting spontaneous expulsion of the infant presenting by breech is shown by a difference of 20 per cent in the babies in good condition after this method of delivery, as compared to those delivered by breech extraction; 80 per cent of the smaller infants delivered by cesarean section were in poor condition and, in this group, there was a correspondingly high fetal mortality.

Neonatal Care

A vast majority of the premature infants received good care in the immediate neonatal period. According to our standards, good immediate care includes: (1) aspiration of mucus and fluid from the mouth and nasopharynx as soon as the mouth and nose are exposed; (2) maintenance of body warmth, by placing the baby in a heated crib, not more than one minute after delivery; (3) administration of pure oxygen to the baby, with an open mask, within one minute of the time of delivery; (4) avoidance of all unnecessary trauma or handling of the baby.

The cord is not tied until temperature and respirations have been stabilized in an incubator and the color of the baby is good. In the very small group of infants in our series who did not receive proper prenatal care, the mortality was significantly increased.

Duration of Pregnancy

In this series, it was found that the estimated duration of pregnancy was of much less importance than the clinical estimation of the size of the baby. Viable and healthy babies were born to mothers who were estimated to be in the twenty-third week of pregnancy, according to all the usual methods of calculation; while, on the other hand, babies who by weight were regarded as premature were estimated to have been born as late as the forty-third week of pregnancy.

Failure to observe special precautions for prematurity in the management of labor for patients presumed to be at term, as well as the administration of large doses of opiates in an attempt to stop labor for patients who are presumed by calculation to have a previable pregnancy, lead to the delivery of asphyxiated babies that might otherwise have survived.

Management

The best results in the management of premature labor and delivery are obtained when no analgesic or sedative drugs are used, and either local or regional anesthesia is given for delivery. Vitamin K should be administered as soon as possible and repeated during labor, to prevent neonatal hemorrhagic disease. Since fetal oxygenation is directly dependent upon oxygenation of the maternal blood, 100 per cent oxygen should be administered to the mother during the second stage of labor, and during delivery.

The premature infant must be handled with the greatest possible care. A large episiotomy should be performed before the presenting part meets the resistance of the pelvic floor, in order to avoid unnecessary trauma. Delivery must be accomplished by the gentlest possible methods, and the fetal head should be guided slowly through the

introitus. Rapid expulsion, with the sudden release of pressure which occurs, frequently results in intracranial hemorrhage. Infants in breech presentation should be permitted to deliver spontaneously to the umbilicus; gentle assistance is then indicated, but suprapubic pressure on the aftercoming head is hazardous, and should be avoided. The second of twins should be permitted to delivery spontaneously, if at all possible.

Summary

It has been shown that the condition of the premature infant at the time of delivery is definitely influenced by analgesic drugs, anesthesia, and the method of delivery.

In this series, no analgesia, regional anesthesia, and controlled delivery, with a large episiotomy, gave the highest incidence of fetal survival.

Prompt aspiration, pure oxygen, a warm crib, and a minimum of handling are essential features of the immediate postnatal care of the infant.

* * *

ANESTHESIA FOR PREMATURE LABOR

Prevention of Anoxia

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RALEIGH

In our efforts to reduce the mortality among prematurely born infants who, while constituting but 5 per cent of the total number of live births, contribute as many deaths to the total neonatal death rate as do all their full term brothers, it would seem wise to examine closely the available data relating to the time and causes of death of these infants. It will be found that most of the deaths among these infants occur early. According to one study[1], one half of the premature infants who died were either stillborn or died without responding to resuscitative measures. Among those who did respond to resuscitative measures but later died, one half did so within the first 24 hours after birth. It would seem, then, that if we are to affect the mortality rate among these infants to any appreciable degree, we must work chiefly through these forces that are operative during the prenatal, natal, and immediate postnatal periods.

Anoxia as a Factor in Neonatal Mortality

Among the forces which may be active during these periods and which may have a profound effect upon the survival of the premature infant is anoxia. In one study, anoxic injury was given as a primary cause of death in 60 per cent of all premature and full-term infant mortality[2].

Anoxia during these periods may occur from a variety of causes, some of which are preventable and some are not. Some are related to anesthesia administered to the mothers, and others are not. The incidence of anoxic injury to the child resulting from efforts to relieve the mother's pain is difficult to determine accurately, but, according to some studies, it is apparently considerable[3]. What is perhaps more important, such anoxia is for the greater part preventable and occurs as a direct result of something we have done. However noble our efforts to relieve the mother's pain, we cannot escape the fact that anoxia in the child as a result of drug depression is a factor in neonatal mortality that does not occur in unattended births.

Mechanisms by which Anoxia is Produced

In order to prevent anoxic injury to the infant as a result of anesthesia, one must understand the mechanisms by which it may occur. These may be outlined as follows:

I. Drug depression
   A. Analgesics, hypnotics, sedatives
   B. Anesthetics
II. Interference with oxygenation of maternal blood
   A. Asphyxiating doses of nitrous oxide and ethylene
   B. Drug depression of maternal respiratory center
   C. Interference with maternal airway
III. Interference with the supply of maternal blood to the placental site: Fall in maternal blood pressure as a result of regional anesthesia.

Drug Depression

Anoxia most commonly occurs as a result of drug depression. Clinical experience leads to the conclusion that the placenta offers no effective barrier to the passage of any of the various depressants of the central nervous system that are used to allay the mother's pain at childbirth, or to alter her reaction to it or memory of it. This is true

Table 1
Effects of Central Nervous System Depressants Upon Onset of Spontaneous Respirations After Birth
(From Irving and others[4].)

Agents	Breathed Immediately After Birth (Per Cent)	Did not Breathe Immediately After Birth (Per Cent)
No drugs or anesthetics	98	2
Pentobarbital and rectal ether	65	35
Pentobarbital and scopolamine	63	37
Amytal and scopolamine	61	39
Amytal and rectal ether	59	41
Pantopon and rectal ether	53	47
Pernocton	53	47
Pentobarbital and paraldehyde	50	50
Pantopon and scopolamine	53	47

Table 2
Incidence of Apnea in Newborn Infants Related to Central Nervous System Depressants Administered to Mothers
(From Schreiber[3a].)

	Per Cent
No anesthesia or analgesia	28.6
Anesthesia only	51.7
Anesthesia and analgesia	65.5

whether the depressants be sedatives, hypnotics, analgesics, or anesthetics.

A further important fact is that depressant drugs administered during labor seem to have a more profound effect upon the central nervous system of the infant than upon that of the mother. Anyone who has administered much obstetric anesthesia has seen instances in which mothers, whose central nervous system seemed hardly depressed at all and whose respirations were full and vigorous, have given birth to profoundly depressed infants. One pediatrician who has devoted a great deal of thought to this problem has stated that he has never seen a child born of a mother in second plane anesthesia who breathed normally[5]. The increased susceptibility of the infant's central nervous system to depression by drugs is the only apparent explanation for the fact that the same concentration of the drug that produces plane[2] anesthesia in the mother produces plane[4] anesthesia, or something closely akin to it, in the child.

Of course, while the depressant drugs reach the infant in utero by way of the placenta, the anoxia the infant suffers occurs in the immediate postnatal period, and for the reason that, his central nervous system being depressed, there is a delay in onset of spontaneous respiration. Figure 1 illustrates the increased susceptibility of the premature infant to drug depression, and points up the wisdom of abstaining from the use of depressant drugs in premature labor in the absence of a clearer indication than the desire to relieve the mother's pain.

Interference With Oxygenation of the Maternal Blood

The second mechanism by which anoxic injury to the infant may occur as a result of efforts to allay the mother's pain is that which occurs secondary to interference with the oxygenation of the maternal blood in the lung. This type of anoxia occurs, of course, while the fetus is in utero, and when it is dependent for oxygen upon the maternal blood brought to the placental site.

Asphyxiating gases

Possibly the most common cause of interference with the oxygenation of the maternal arterial blood is that which occurs as a result of too high a dilution of the mother's inspired air with asphyxiating anesthetic gases, namely, nitrous oxide and ethylene. These gases, compared to ether, chloroform, and the like, are extremely weak anesthetic agents. In an unpremedicated patient and in the presence of a normal degree of oxygenation of the arterial blood, they cannot produce by their action *per se* profound depression of central nervous system function. Indeed they may not be able, in the presence of an adequate oxygenation of the arterial blood, to produce that degree of depression or plane of anesthesia which may be sought. They can, however, be made indirectly to produce any degree of depression of the central nervous system. This is done when the amount of oxygen in the inspired area is diluted to a degree that interference with the oxygenation of the arterial blood occurs, resulting in anoxia that further depresses the central nervous system. As the maternal central nervous system is depressed by anoxia, the fetal central nervous system is likewise depressed. Moreover, this type of depression is more hazardous to the fetus than that which occurs as a result of drug action *per se*. For, in contrast to the depression caused by sedatives and analgesic drugs which ceases once the offending agent is removed, the depression resulting from anoxia not only alters the function of the central nervous system during the anoxia, but may cause structural changes which permanently alter the function of the central nervous system[6].

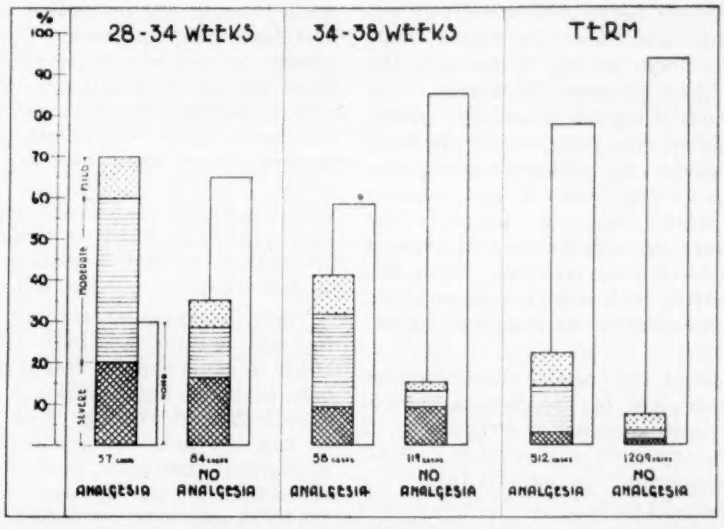

Fig. 1. The effect of analgesics upon the incidence (percentage) of asphyxia neonatorium in infants of varying degrees of maturity. (From Lund, C. J., in Am. J. Obst. & Gynec. 41:935 (June) 1941. Courtesy, the C. V. Mosby Co.)

The child born of a mother who has been asphyxiated is in a more precarious position than one whose central nervous system is depressed as a result of drug action *per se*. For in the case of the child whose depression is a result of anoxia, the dangers of delayed onset of extra-uterine respiration are to be added to the dangers that have already resulted from anoxia occurring before birth.

Eastman[7] has studied the problem of anoxia and the resulting neonatal apnea in the infants whose mothers were given nitrous oxide and oxygen anesthesia in asphyxiating doses. In his experience, nitrous oxide and oxygen given in proportions of 90 per cent to 10 per cent—and it is not uncommon to see it so administered—for three minutes or longer, resulted in severe degrees of anoxia in 1 out of 3 babies. When given in proportions of 85 per cent to 15 per cent for less than three minutes, it did not seem to cause harmful anoxia. In this connection, it should be pointed out that, with proper care in administration, nitrous oxide comes nearest to producing the ideal in obstetric anesthesia than does any other agent, and it is a shame that abuse of the agent has caused it to fall into disrepute. One can, with nitrous oxide, relieve the mother's pain without causing her to lose consciousness, without asphyxiating her or her baby, and without interfering with the prompt onset of spontaneous respiration in the child after birth. If it seems wise to allay the pain in the first stage of premature labor, this technique would seem the most rational way to do it.

Other means

Other means by which anoxia of the fetus may occur secondary to interference with the oxygenation of the maternal arterial blood are: (1) depression of the respiratory center of the mother as a result of drugs acting on her central nervous system; (2) obstruction to the mother's airway. Space will not allow me to discuss the various mechanisms by which this obstruction may occur under anesthesia. Suffice it to say that the administration of a general anesthetic to a mother, particularly one in premature labor, when one cannot be sure beyond a reasonable doubt that her stomach is empty, would seem hard to justify.

Interference with Blood Flow Through the Placental Site

A third means by which measures designed to relieve the mother's pain of labor may cause anoxia in the child is by interference with the free flow of blood through the placental site, due to falls in maternal blood pressure. There is not currently available a local anesthetic agent which, when ap-

plied to a mixed nerve, will selectively anesthetize the pain fibers and leave unaffected those fibers having to do with the control of blood pressure. Therefore, with all the methods of regional anesthesia wherein exists an avenue along which the local anesthetic agent may travel from the site of injection to that part of the neuraxis where the nerve fibers for the control of blood pressure are concentrated, the threat of a fall in blood pressure exists. Such avenues exist with both spinal and peridural anesthesia, whether by the caudal or lumbar approach.

In a report of 1200 caudal anesthetics for labor, 20 per cent of the fetuses showed signs of distress (slowing or irregularity of heart tones, expulsion of meconium) shortly after the anesthetic drug was injected[8]. In 4 instances, signs of fetal life disappeared after the institution of caudal anesthesia. Falls in blood pressure that are well tolerated by the mother may prove lethal to the fetus.

Advantages of Regional Anesthesia

The admirable results that can be obtained with properly managed regional methods of anesthesia in premature labor are illustrated by the report of Master and Rose[9], who were able to report one of the lowest death rates among premature infants in the literature (10 per cent). Moreover, they rightly pointed out the positive protection these methods of anesthesia afford the delicate premature infant through relaxation of the pelvic floor. To obtain such results, however, more than technical skill is required. Understanding of the alterations in the physiology of parturition, circulation, and respiration these methods may entail are needed, so that deleterious effects may be prevented or combated, should they occur.

There is available, however, a method of regional anesthesia which seems to have much to commend its use in premature labor—pudental block. While it will not give as complete relaxation of the pelvic floor as will the more commonly used methods of regional anesthesia, neither will it *per se* cause fetal anoxia. The simplicity by which the block can be accomplished (fig. 2) either in hospital or in home deliveries commends its use. While it will not relieve the pain of the first stage of labor, it will relieve that of the second stage, which has been shown by recent fairly objective measurement to be the most intense[10]. Under present conditions in North Carolina, this method of anesthesia, if widely adopted, would seem to offer the most promise in reducing the mortality among prematurely born infants.

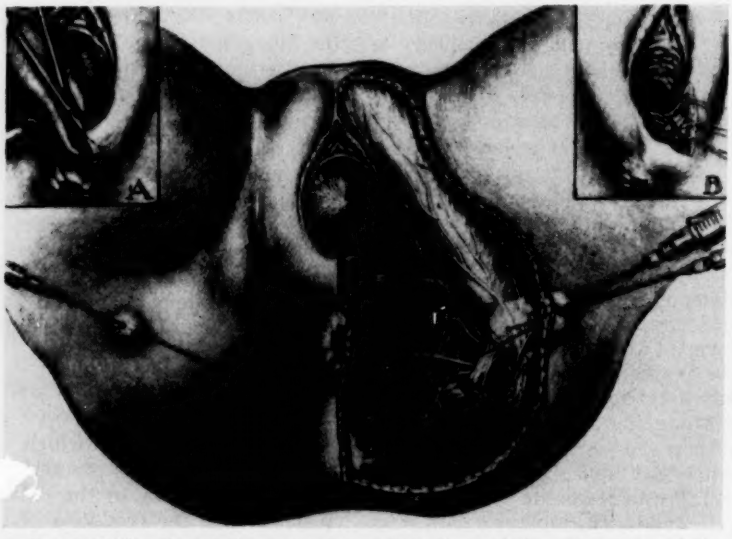

Fig. 2. Infiltration of the perineal branch of the posterior cutaneous and the pudental nerves for delivery. Insert A shows the episiotomy, and insert B shows the repair. (From Pitkin's Conduction Anesthesia, edited by Southworth, J. L., and Hingson, R. A. Courtesy, the C. V. Mosby Company.)

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THE HOSPITAL MANAGEMENT OF PREMATURE INFANTS

ANGUS MCBRYDE, M.D.

DURHAM

The first step in keeping the premature infant alive is the initiation of adequate respiration. Fortunately, even in the premature infant, resuscitation is spontaneous in the great majority of cases. Only the usual procedures of milking the trachea and aspiration of material from the oropharynx are necessary. However, as the immature infant is more subject to depression of the respiratory center due to anesthesia, narcosis and fetal anoxia, and since his thoracic cage and respiratory muscles are less strong, there is always the possibility that resuscitation will be necessary.

Aspiration of material also is more frequent because of the decreased laryngeal reflex. For several years we have been interested in this problem, and met it at first by tracheal suction followed by continuous intratracheal oxygen through a Foregger valve set at a maximum of 15 mm. of mercury pressure. Under this method many infants who did not breathe for 10 minutes to two hours remained pink and subsequently were normal. We found, however, that continuous oxygen pressure did not allow for adequate elimination of carbon dioxide, and that absence of the normal pumping action of the respiration tended to throw an increased load on the cardio-circulatory system. Therefore, on the advice of Dr. C. R. Stephen, our anesthesiologist, we are now using intermittent oxygen pressure through an intratracheal catheter in series, with a bag and a non-rebreathing valve, so that the intratracheal pressure may be increased and decreased, and insufflation occurs at the rate of 16 to 20 times per minute. The water manometer, which is usually set at 10 cm. of water pressure, acts as a safety valve. This apparatus (description to be published) is easy to use and relatively inexpensive as compared to the usual commercial respirator.

The importance of administering oxygen to the premature infant for several days following birth must be stressed, as there is a relative tissue anoxia (especially in the small baby) although his color may be good. Such factors as the easily collapsible thorax, lack of capillary and alveolar epithelial development, and the presence of fetal hemoglobin make the continuous administration of oxygen necessary for the smaller premature infants for one to two weeks. This can be accomplished in the Armstrong incubator, with an oxygen concentration of about 50 per cent, by a continuous flow of 3 liters per minute with the upper vents closed. If the incubator has been opened, the flow must be increased to 15 liters per minute for two minutes after closing it. It is necesary to test each incubator, as they may vary in this regard. Oxygen is second only to nursing care and is the main expense in the premature nursery. It is often used longer than necessary.

Sulfonamide and Penicillin Therapy

Also worthy of mention is the early use of sulfonamides or penicillin in (1) infants who have required resuscitation, (2) infants born of infected mothers or mothers whose membranes have been ruptured for some time, (3) infants who are born outside the hospital, and (4) infants who display such symptoms as listlessness, vomiting, diarrhea, and fever. Therapy should be begun at once before a diagnosis is made, as waiting may result in death of the infant. Where kidney function has been well established, Gantrisin, 1 grain per pound per day, may be given orally. Otherwise, we use penicillin, (10,000 units every 6 hours). Streptomycin, 50 mg. every 6 hours, also should be given

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if diarrhea occurs. We have seen no increase in monilia infections in our premature infants, although we have used penicillin for the past six years. Recently we have used terramycin, 20 mg. per pound, per day, but this causes diarrhea in many infants.

The Prevention of Infection

In order to aid in the prevention of infection, the premature nursery should have several units. No unit should contain more than four beds. First, one needs a small observation unit in which infants admitted from the outside of the hospital may remain for approximately one week, during the first five days of which they are given penicillin as described above. In addition to the regular nursery and observation unit, there should be, at some distance if possible, an isolation unit for those infants who are actually ill when they come in and for those who acquire infection in the nursery. We find that infants often will be admitted to the observation unit with unrecognized infection, and these require immediate isolation.

Since in many cases physical evidence of infection in premature infants does not appear until it is too late for therapy, it is necessary for the physician in charge to have an effective method of determining the infant's condition daily. This is best accomplished by adequate notes recorded by the nursing service at the time of each feeding. These data consist of the axillary temperature, method of feeding, type of feeding, the amount given, the amount refused, and any regurgitation; also, how well it is taken. The number and appearance of the stools, urination, medicaments, vitamin preparations given, and a comment on the infant's condition are included; the house officer's notes are also recorded on this sheet. A rapid study of this sheet for each 24 hour period in conference with the house staff and the nurse in charge gives an adequate picture of the infant's progress.

Nutrition

Much has been written concerning weight curves, with emphasis on the need for rapid weight gain. This, it seems to us, has been stressed too much, even to the point of "stuffing" the infant, with resultant regurgitation and aspiration into the trachea.

In infants weighing less than 1500 Gm. we routinely use gavage feeding, but substitute one to two nipple feedings as soon as the infant's condition will allow. The change to nipple feeding should be gradual. Infants weighing less than 1500 Gm. do not require food before 48 hours of age.

Hydration of the premature infant has been greatly overstressed, especially the repeated use of physiologic saline solutions which entail a marked increase in chloride intake. We seldom find it necessary to give subcutaneous fluids to premature infants, and then use equal parts of physiologic saline and 5 per cent dextrose solutions.

Recent reports on the use of ACTH in premature infants suggest that it is not without danger, although it may be of some value in arresting retrolental fibroplasia. It should not be used except under carefully controlled conditions and for a specific purpose.

It is our practice to supplement the diet of the premature in the second week with a water soluble multiple vitamin preparation containing vitamins A, D and C, and the B complex, gradually reaching a dosage of 0.6 to 1 cc.* daily, and in addition to give 50 mg. of vitamin C daily, making a total of 100 mg. daily. Vitamin C has proved to be valuable in the metabolism of aromatic amino acids, which are found in relatively large quantities in cow's milk.

The administration of iron does not prevent the development of the so-called anemia of prematurity, but begun at 6 weeks' of age is prophylaxis against the later incidence of iron deficiency anemia. We use 2 to 4 grains of ferrous iron in liquid form daily.

Conclusion

Once a routine has been established, the hospital care of the premature infant resolves itself into adequate nursing, with one nurse on duty each eight hour period for not more than six infants. After the initial examination the physician should confine his duty to inspection of the nurses' records and daily consultation with her concerning the infant's progress.

*Six-tenths cubic centimeter contains vitamin A 5000 U.S.P. units, vitamin D 1000 U.S.P. units, B_1 1 mg.; B_2 0.5 mg.; C, 50 mg.; niacinamide 10 mg.

EVALUATION OF THE NORTH CAROLINA PREMATURE INFANT CARE PROGRAM

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Premature birth is the greatest single cause of neonatal and infant mortality in North Carolina, as well as in the United States[1]. Recognition of this fact has resulted in the establishment of premature infant care programs such as this state has had for the past two and one half years..

Any public program needs to be evaluated at intervals in terms of its objectives so that the effort and the money expended may be directed into those channels which will strengthen it. Prematurity is recognized as both an obstetric and a pediatric problem. The obstetric effort is directed toward better prenatal care, such as the detection and treatment of abnormal conditions of pregnancy, to lessen the chance of premature labor. If premature labor is imminent, then the management of the labor and delivery should be aimed toward minimizing the risk to the premature infant without endangering the mother[2]. The pediatric aim is to place the premature infant in the type of environment that will give him the optimum chance for survival. To these may be added a third approach—that of public health. This principally has to do with the administration of such a program, case finding, and follow-up.

A premature infant care program consists first of care, which includes early case-finding, transportation, and the use of properly equipped hospitals manned by trained medical and nursing personnel, in strategic areas throughout the state. Investigation of the home and the follow-up of the infant's progress is part of the continued care in such a program. A secondary aspect, which is just as important as care, is the education and training of doctors, nurses, and the public. A third phase is that of administration. This paper will attempt to discuss and evaluate the above components of the North Carolina Premature Infant Care Program.

From the North Carolina State Board of Health, Raleigh, North Carolina.

Care

Case-finding

In the early days of the program a bill was passed by the Legislature requiring the reporting of all prematurely born infants to the local health departments within 24 hours. This law needs to be emphasized further; a number of physicians and hospitals are not reporting births until after the infant becomes ill. The health department is then called and a request is made that the baby be taken to a premature center.

Transportation

Each county health department should be furnished with at least one infant carrier equipped with oxygen and heat. The majority of the counties in this state are so equipped. Conferences are held with the local public health nurses to instruct them in the program and in the use of the carriers, which may also be used to transport infants to local hospitals as well as to the state sponsored premature centers.

Hospital care

The original plan called for the establishment of seven premature infant centers in the larger hospitals of the state, located within a 60 mile radius of the majority of the population. The program was initiated in the only two hospitals in the state that approached the standards of a qualified premature center, as set by the American Academy of Pediatrics[3]. The two original centers were enlarged and four others have been opened, making six centers in the state with a total capacity of 85 beds.

All of the hospitals, with the exception of one which is used as a teaching hospital, bore their own costs of remodeling. In one instance the Junior League supplied the funds necessary to establish the center. The seventh of the originally proposed centers has not been opened because of the lack of funds. This proposed center, which was to be located in the Charlotte area, is greatly needed. In the past year the program has had to reduce the premature beds sponsored by it to two thirds of the capacity of the centers. Since there are still not enough beds in the approved centers to take care of the requests for hospitalization, priority has to be given to infants in the lower weight groups. The medical and nursing care which the premature infants receive is of good quality, and there has been, in most cases, a marked re-

Table 1
Duke Hospital Premature Infant (White) Mortality Statistics Before and After Opening of Center*

	Before Center (1947)		After Center First Year		After Center Second Year	
Weight Group	No. Infants	Mortality	No. Infants	Mortality	No. Infants	Mortality
1000 Gm. or less	5	100.0%	3	100.0%	7	57.1%
1001-1500 Gm.	11	63.6	21	28.5	13	7.4
1501-2000 Gm.	15	26.6	27	29.6	21	14.3
2001-2500 Gm.	55	5.4	41	24.3	44	0
TOTALS	86	22.2%	92	19.5%	85	9.4%

*Infants born in hospital and admitted from outside.

duction in the mortality since the centers opened (tables 1, 2, 3, 4, and 5).

Secondary centers

A plan was formulated to encourage other hospitals in the state which had a qualified pediatrician on the staff to establish premature nurseries. A graduate nurse from the hospital was given a scholarship in a course in premature care, lasting from six to eight weeks. On her return, the nurse was placed in charge of the premature nursery. The hospital was given two incubators and designated as a secondary center. In the past year four of these secondary centers have been established. Other hospitals which have been enlarged through grants of the Medical Care Commission have shown interest in the premature problem by requesting consultations in the establishment of premature nurseries.

Investigation of the home and follow-up

The homes of the infants who are in the centers are visited by the local public health nurses prior to their discharge. The families are advised as to the needs and equipment. Other agencies, such as the Welfare Department, have been cooperative in aiding needy families. When the infant returns home, the local public health nurse usually makes several visits.

A one year follow-up of all premature infants coming under the program has been instituted. Questionnaires urging that the parents take the infant to their physicians or the local health department for examination are sent out on the child's first birthday. Results of the first 119 of these questionnaires reveal that 10 of the infants died within the year they graduated from the center. Four of the deaths were due to pneumonia, 4 to diarrhea and enteritis, 1 to con-

Table 2
Biltmore Hospital Premature Infant Mortality Statistics (White) Before and After Opening of Center*

	Before Center (1948)		After Center First Year		After Center Second Year	
Weight Group	No. Infants	Mortality	No. Infants	Mortality	No. Infants	Mortality
1000 Gm. or less	1	100.0%	11	81.8%	15	86.6%
1001-1500 Gm.	2	100.0	26	46.0	27	18.5
1501-2000 Gm.	0	0	46	19.0	42	19.0
2001-2500 Gm.	4	75.0	17	0	7	0
TOTALS	7	43.0%	100	30.0%	91	28.5%

*Infants born in hospital and admitted from outside.

Table 3
Baptist Hospital Premature Infant Mortality Statistics (White) Before and After Opening of Center*

	Before Center (1948)		After Center First Year		After Center Second Year	
Weight Group	No. Infants	Mortality	No. Infants	Mortality	No. Infants	Mortality
1000 Gm. or less	6	83.0%	6	50.0%	5	60.0%
1001-1500 Gm.	8	62.5	21	38.0	40	20.0
1501-2000 Gm.	11	9.0	47	8.5	55	12.7
2001-2500 Gm.	43	0	64	9.4	86	9.3
TOTALS	68	16.2%	138	15.2	186	14.0%

*Infants born in hospital and admitted from outside.

Table 4
Watts Hospital Premature Infant Mortality Statistics (White) After Opening of Center

	First Year		Second Year	
Weight Group	No. Infants	Mortality	No. Infants	Mortality
1000 Gm. or less	5	80.0%	8	75.0%
1001-1500 Gm.	15	53.3	9	22.0
1501-2000 Gm.	28	15.0	12	17.0
2001-2500 Gm.	68	0	64	3.0
TOTALS	116	13.8%	93	12.0%

Table 5
Rex Hospital Infant Mortality Statistics (White) Before and After Opening of Center*

Before Center (1944-1949)

TOTAL ADMITTED	439
TOTAL EXPIRED	144
MORTALITY	32.8%

After Center

	First Year	
Weight Group	No. Infants	Mortality
1000 Gm. or less	5	80.0%
1001-1500 Gm.	10	70.0
1501 2000 Gm.	15	20.0
2001-2500 Gm.	40	12.5
TOTALS	70	27.1%

*Infants born in hospital and admitted from outside.

Table 6
Deaths After Discharge from Premature Centers*

Weight Group	No. Discharged	No. Expired	Causes of Death: Respiratory	Gastrointestinal	Intracranial	Other
1000 Gm. or less	2	0	0	0	0	0
1001-1500 Gm.	42	3	2	1	0	0
1501-2000 Gm.	58	4	2	1	0	1 (C.H.)
2001-2500 Gm.	17	3	1 (T.B.)	2	0	0
TOTALS	119	10	5	4	0	1

genital heart disease, and the other to tuberculosis. These deaths, with the possible exception of the one due to congenital heart disease, are preventable. In each case the death is queried. The infant who died of tuberculosis had an itinerant uncle with an open case of tuberculosis (discovered later), who had visited the family after the baby returned home.

The mental and physical development of the 109 infants who survived was not very different from that of a full-term infant, with the exception of the 2 in the lowest weight group (less than 1000 Gm.). The average weight at one year was between 19 and 21 pounds. The average infant sat alone at 7 months, walked at 10 to 13 months, while the 2 in the lowest weight group sat alone at 8 months and walked at 18 months (table 6).

The remainder of the 109 infants that survived the first year had abnormal findings in 18 cases on physical check-ups at one year. Two of the infants in the 1000 to 1500 Gm. weight group had retrolental fibroplasia. These, fortunately, were the only cases in the 109. There were 3 cases of cerebral palsy, 1 of hernia, 1 of harelip, 2 of strabismus, and 1 of rickets.

It is evident that our follow-up of these premature infants needs to be strengthened by a closer supervision during the first year. This might be accomplished by contacting the parents at stated intervals throughout the first year, probably at the third, sixth, and ninth months, advising the mother in the care of the premature baby, and urging frequent check-ups by a physician. The importance of this care can be impressed on the mother by the nurses in the premature centers before the child leaves. The local public health nurses can then continue to maintain close contact with the family for at least one year.

*One year follow up on initial 119 premature infants.

Education and Training

Education is an integral part of any premature infant program. Facilities for training professional personnel in premature infant care are necessary. Training centers outside the state may be used until one is established in the state.

Duke University Hospital is being developed into a training center. At present a three weeks' course is being offered to public health nurses, and plans are underway to provide an accredited clinical course in premature care to serve the needs of those who work in hospital nurseries. It is hoped that with the establishment of a training center at Duke University, close coordination between the pediatric department, obstetric department, and the nursery can be worked out to give the very best premature training and experience.

The program has helped in the establishment of an accredited course in premature care for Negro public health nurses at the North Carolina College in Durham. This is open not only to local public health nurses but also to regional public health nurses.

Refresher courses for general practitioners, pediatricians, and obstetricians are needed in the prevention of premature births as well as in premature care. The program has focused attention on the problem of prematurity, which has been a frequent subject of the medical symposiums held in the state.

Administration

The Maternal and Child Health Section of the Department of Public Health, which is concerned with the activities to improve the care of mothers and infants, is the logical administrative unit for a statewide Premature Infant Care Program. The State Health Department, through its local organizations and public health nurses, reaches the people in all parts of the state. The administrative unit plans and coordinates the program, with the aid of frequent conferences with the hospital, medical, and public health personnel.

Accurate records and statistics regarding premature infants are needed. 1950 was the first year in which birth weight was recorded on birth certificates in this state, making it possible to tell with considerable accuracy how many premature infants were born in North Carolina in the past year, and also the percentage of infants in each

Table 7
Incidence of Premature Births in North Carolina* 1950

Live Births	*Premature Weight*	*Incidence of Premature Births*
106,359	7,873	7.4%

Classification of Premature Births by Weight Groups		
Weight Group	*No. Births*	*Per cent*
1000 Gm. or less (2 lb., 3 oz. or less)	374	4.8
1001-1500 Gm. (2 lb., 4 oz.-3 lb., 4 oz.)	678	8.6
1501-2000 Gm. (3 lb., 5 oz.-4 lb., 6 oz.)	1483	18.8
2001-2500 Gm. (4 lb., 6 oz.-5 lb., 8 oz.)	5338	67.8

*Source: Division of Vital Statistics, North Carolina State Board of Health.

of the four weight groups. It is well to point out that instead of the 5 per cent figure usually given as the percentage of premature births in North Carolina, the state has 7 per cent (table 7). The majority of the infants are in the highest weight group, in which the prognosis is good.

One of the policies of the program which needed further study was that of determining which parents of premature babies needed financial aid through the program. Under some other state programs only families that are certified for welfare assistance are allowed financial aid in the hospitalization of premature infants. It has been the contention of the Premature Program advisory group, however, that a number of families in the middle income group who need aid with this long-term care would be screened out by adherence to the policy of welfare certification.

In the last few months a graduate student in the School of Public Health of the University of North Carolina, Dr. James Wardlaw, made an economic study of the first 1,068 infants that were cared for under the North Carolina Premature Infant Care Program. Out of 930 cases in which an income was reported, 891 of the families had an income of $200 or less per month. Three hundred and sixty-one of the 891 had an income of less than $100 a month. Seven hundred and nine out of 930 applicants were listed as renting their homes, and 192 owned their own homes. It is doubtful whether any of the parents whose income is $200 a month or less could have financed the hospital costs of caring for a premature infant whose average hospital stay is 28 days, at an average cost of about $410.

Results

The Public Health Statistics Section of the North Carolina State Board of Health reports that the premature death rate increased in the year 1948 to 1949, but the 1949 to 1950 figures show a decrease (13.6 to 13.4)* per 1000 live births. The infant death rate in the state dropped from 37.9 per 1000 live births in 1949 to 34.8 in 1950*. The 1950 figure will be the lowest infant death rate recorded in North Carolina if the 1950 provisional figures hold.

It is hoped that the Premature Infant Care Program will stimulate more interest in premature infants, and, perhaps research in regard to the causes of prematurity. Certainly more information on the obstetric aspects of prematurity is urgently needed. One of the contributions the program has already made to the state is that it has stimulated interest in improving the newborn services in other hospitals, as evidenced by the increase in inquiries as to the establishment of secondary centers, and in requests for consultations regarding the nurseries of newborn and premature infants, and formula rooms.

*1950 provisional figures.

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U.S. Maternal Death Rate Establishes New Low Record

For the first time in history, the maternal death rate for a large nation has been pushed slightly below the apparently irreducible minimum of one per 1,000 live births, according to the **Journal of the American Medical Association** (Nov. 25, 1950).

The new record compares with 1.2 maternal deaths per 1,000 live births in 1948 and with 6.2 in 1933. On that basis, the **Journal** concluded that "childbirth has been made quite safe." In 1949 there were thirty states with rates less than 1.0, two at exactly that level and only seventeen above.

"The fact that the chances of an expectant mother surviving the diseases of pregnancy, childbirth and the puerperium [confinement period] are now better than 999 out of 1,000 is truly a story of human and social progress," said the **Journal.**

The reduction in the death rate from 1933 was attributed to several factors: (1) an increasing percentage of births in hospitals, although improvements in the medical care provided in home births have been pronounced; (2) development of prenatal care; (3) health education; (4) the administration of sulfonamides, antibiotics, whole blood or blood derivatives, and (5) improvement in training in obstetrics.

Unlike the trend in many nations, the number of births attended by midwives in the U.S. is being rapidly reduced, it was pointed out.

URETEROSIGMOIDOSTOMY: PAST AND PRESENT

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and
HAMILTON W. McKAY, M.D.
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The purpose of this discussion is to present modern thinking on transplantation of the ureters into the bowel, and to contrast the old so-called tunneling method, advocated by Coffey, with the new mucosa-to-mucosa technique, advocated by Cordonnier and made possible by the preparation of the bowel with the modern application of chemotherapy and the antibiotics.

The Coffey Technique

Until the introduction of the antibiotics and certain chemotherapeutic measures for sterilizing the bowel, it was impossible to obtain a satisfactory ureteral transplant except by the so-called "tunneling method" which was employed by Coffey and is still used by many urologic surgeons. This was true because the coliform group of organisms produced a breakdown at the suture line.

In the Coffey method, the bowel is tunneled and the ureter is brought through the tunnel, with the end opening into the lumen of the bowel, as shown in figure 1. This technique has several undesirable features. (1) It is not a principle that is employed in other branches of surgery, such as in the bowel and blood vessels. (2) At the point where the bowel is tunneled, scarring and fibrosis occur and later on produce constriction, with dilatation of the ureter above; and, of course, infection is usually associated with poor urinary drainage. (3) There is usually present also a concentric fibrosis of the ureteral stump that projects into the lumen of the bowel. To quote Nesbit[1]: "But progress in science often makes the impossible of yesterday a reality today; and the agents now available for combating infection have encouraged the re-evaluation of this once-discarded procedure. The results appear to be most encouraging."

Mucosa-to-Mucosa Technique

Chaput, in 1896, was the first to employ a mucosa-to-mucosa anastomosis of the bowel and ureter, but abandoned the idea. In later years the application of this technique has occupied a prominent place in the field of genitourinary surgery. The indications are clear-cut:

1. Exstrophy of the bladder (curative)
2. Early carcinoma of the bladder, where there is a chance of a cure by cystectomy used in conjunction with this procedure
3. Interstitial cystitis, wherein there is no chance of improvement by other available procedures
4. Inoperative carcinoma (palliative).

Cordonnier in 1947 put the mucosa-to

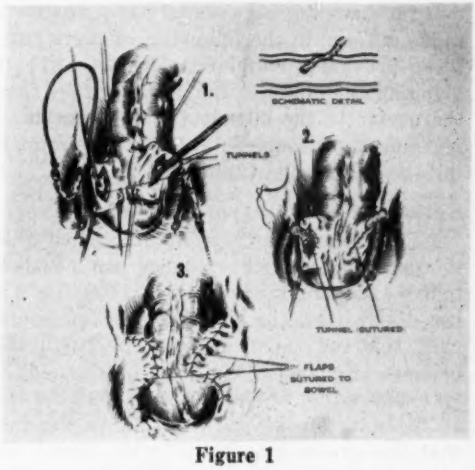

Figure 1

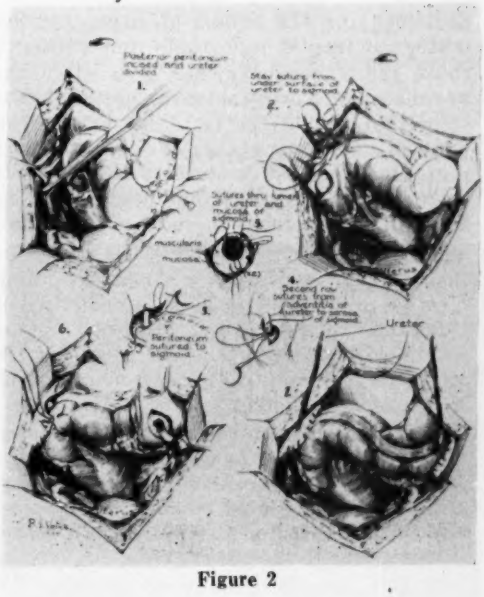

Figure 2

Read before the Second General Session, Medical Society of the State of North Carolina, Pinehurst, May 9, 1951.

mucosa technique on a sound basis. His technique differed in the following respects from those previously employed (fig. 2): (1) in bringing the bowel to the ureter rather than the ureter to the bowel; (2) in transplanting mucosa to mucosa; and (3) in eliminating the submucous tunnel[1].

Advantages

It has been pretty well established that if stasis in the urinary tract can be eliminated, recurrent episodes of infection are less likely to occur. It is our belief, moreover, that the so-called pyelonephritis usually associated with the Coffey method of transplantation is due to stenosis at the site of the anastomosis rather than to the fact that the ureter empties into the bowel, inasmuch as ureteral peristalsis is a good impediment for the reflux of urine up the ureter. In fact, it is virtually impossible to cause reflux up the ureter even after the so-called ureterovesical valve has been destroyed if the ureter is of normal caliber and has normal peristalsis. We are convinced that the so-called ureterovesical valve is more or less a myth. It has been shown by Hinman that in fowls there is nothing analagous to the ureterovesical valve.

Another factor in urinary drainage which must be considered is undue angulation of the ureter. By bringing the bowel to the ureter without disturbing the course of the latter, as is done in the Cordonnier method, one is much less likely to encounter stasis.

It is a fundamental principle of intestinal surgery that if postoperative scarring and stenosis are to be avoided, a mucosa-to-mucosa anastomosis must be done. Why, therefore, would this not be true in anastomoses of the ureter to the bowel? We see no reason why this procedure cannot be performed if one can anastomose blood vessels or one portion of the bowel to the other. The principle is the same.

By eliminating the so-called submucous tunnel, one also obviates another site for stenosis leading to infection and the concomitant sequelae. What would happen if one took a piece of bowel and introduced it into the side of another portion so that 2 or 3 cm. of the end of one portion protruded into the lumen of the other? This is exactly what is done in the Coffey technique. One can readily see how this would lead to stasis by kinking of the ureteral stump which protrudes in the lumen of the bowel, if it did not slough off; and if sloughing did occur, one could not be sure where it would end.

Figure 3 (Case 2)

Preparation of the bowel

The success of the mucosa-to-mucosa method depends on careful preparation of the bowel. This is done by means of a low residue diet for about five days preceding the operation, along with magnesium sulphate given orally, and enemas. The patient is also given sulfathaladine for several days before and after the operation. Oral streptomycin or one of the other oral antibiotics can be used, if desired. However, we have found that 1. Gm. of sulfathaladine given three times daily for about four days preceding the operation, and from 10 days to two weeks following the operation is effective. A Wangensteen suction is used for about 24 to 48 hours following the operation.

Illustrative Cases

It is our opinion that the days of "dunking" and "tunneling" in ureteral transplants are nearing an end. Because the proof of a

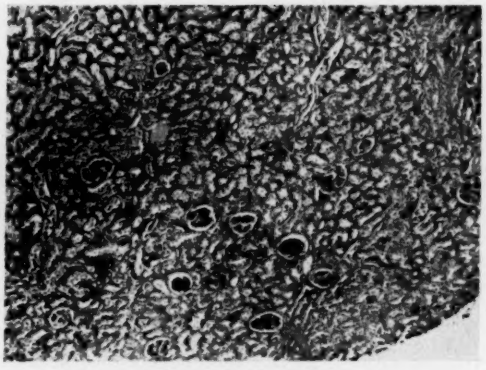

Figure 4 (Case 2)

method lies in the results, the following cases are presented. The first case was selected to illustrate the Coffey technique, while the following five cases illustrate Cordonnier's method. These 5, we would like to emphasize, are consecutive cases, and thus provide a more accurate idea of the usefulness of the procedure than could be obtained from selected cases.

Case 1 (Coffey technique)

A 31 year old Negro man was admitted to the hospital with a diagnosis of exstrophy of the bladder. The physical examination yielded no unusual findings, and a bilateral retrograde pyelogram revealed normal kidneys on both sides. The right ureter first was transplanted by means of the Coffey technique. In about two weeks the left ureter was transplanted and the bladder removed.

The patient's postoperative convalescence from both operations was rather stormy, with many periods of chills and fever. He was finally discharged from the hospital about five weeks after the first ureteral transplant. After leaving the hospital, he had repeated episodes of chills and fever, and was finally admitted to the hospital about six months after the operation, at which time he died. On autopsy both kidneys were found to be filled with multiple abscesses, and there was virtually no recognizable kidney parenchyma. Both ureteral orifices, where they entered the bowel, were markedly stenotic, and would admit only a small probe. There was marked scarring around the site of the ureteral anastomosis.

Mucosa-to-Mucosa technique

Case 2

A 38 year old white man was admitted to the hospital with a history of pain in the right costovertebral angle for many years and the complaint that his "urine all leaked out on his abdomen." Physical examination revealed an extremely emaciated man who appeared much older than the stated age. General physical findings were not remarkable except for exstrophy of the bladder, separation of the symphysis, and an epispadias. Purulent material could be seen exuding from the right ureteral orifice. Urologic examination revealed that the right kidney was non-functioning and contained many stones, and a diagnosis of non-functioning calculus pyonephrosis on the right side was made. On the left side, some evidence of minimal dilatation of the lower left ureter and some blunting of the calices were found. Urine cultures obtained from the left side revealed **Aerobacter aerogenes.** The laboratory findings otherwise were esentially normal.

A mucosa-to-mucosa anastomosis of the left ureter to the rectosigmoid was carried out, and the postoperative course was uneventful. For two days following the operation, the patient's temperature was elevated to 100.4 F., then returned to normal and remained so thereafter. An intravenous pyelogram made 14 days after the operation (fig. 3) revealed excellent function on the left side, without any dilation or distortion of the upper tract. It is generally agreed that if any dilatation of the ureter occurs following a ureteral transplant, it is much more marked for the first few months, with improvement at the end of six months. It has been found that in many patients who have a hydronephrosis for the first few months after operation, the dilatation tends to return to normal after six months. In about two weeks following this operation, a nephrectomy was done on the right side, followed by a normal convalescence. The patient was discharged from the hospital in good condition.

This patient was followed for two years and nine months, during which time no episode of pyelonephritis occurred and his blood chemistry remained normal. About two years and nine months following the ureteral transplant, he entered another hospital and died of causes which were unrelated to his urinary tract. At autopsy the ureter and kidney revealed no more dilatation than was apparent on the preoperative roentgenograms. Moreover, as can be seen from the photomicrograph of a section of the kidney (fig 4), there was no evidence of pyelonephritis.

Figure 5 (Case 3)

Comment: The autopsy findings offer convincing evidence as to the efficacy of a mucosa-to-mucosa transplant. The patient lived for two years and nine months without pyelonephritis, and at the time of death the microscopic sections failed to reveal any evidence of pyelonephritis of the only kidney.

Case 3

A 71 year old white man was admitted to the hospital with a diagnosis of inoperable carcinoma of the bladder. On admission he was markedly emaciated, and stated: "I am up all night, trying to urinate, and I pass a lot of blood." Urography showed the upper urinary tract to be normal, however; and, inasmuch as the patient was having intractable pain which required large doses of opiates, and had to sleep with a urinal in the bed because of frequency and gross hematuria, it was decided to do a palliative ureteral transplant. This operation was carried out, and both ureters were transplanted simultaneously. The postoperative course was uneventful except for the beginning of a wound disruption on the seventh postoperative day, which was resutured. The patient's temperature never rose above 101 F., and on only one day did it rise this high. As can be seen from the urograms (fig. 5) which were made 16 days following the bilateral ureteral transplants, the patient had good function on both sides, with no dilatation or distortion of the upper tract. He remained in the hospital about 19 days following the operation.

For seven months this patient was able to enjoy a perfectly comfortable life, after which auricular fibrillation and cardiac decompensation developed, from which he recovered after a hospital stay of two weeks. In about nine months following the operation he died of coronary occlusion. Autopsy studies revealed no damage from poor urinary drainage.

Comment: It is our feeling that if one can give a 71-year old man nine months of comfort, this operation is justified. This belief is shared by many others at the present time. Flocks recently stated that "Ureteral transplants as a procedure for palliation is assuming greater and greater importance."[3]

Crane[4] recently published an article emphasizing the use of this procedure in cases of inoperable carcinoma purely for palliation.

Case 4

A white man, 55 years of age, was admitted to the hospital with a history of gross hematuria for about six to eight months, and some pain in the suprapubic region. On physical examination his general condition appeared to be good. Urologic examination revealed both kidneys to be normal. Cystoscopy revealed a diverticulum in the region of the right side of the bladder, with what appeared to be a tumor protruding from the mouth. Examination of a biopsy

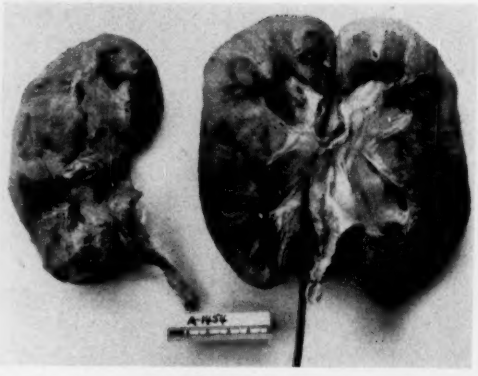

Figure 6

specimen proved this to be an infiltrating carcinoma of the bladder, of either a stratified squamous type or transitional cell type, and apparently containing some elements of both. A cystogram disclosed that the carcinoma was in the diverticulum (fig 7).

It was decided to perform a bilateral ureteral transplant with cystectomy. The transplant was carried out according to the mucosa-to-mucosa technique of Cordonnier. The patient's postoperative course was uneventful, with only a low grade fever for two days following the operation. An intravenous urogram made 12 days after the operation (fig. 8) revealed both kidneys to be functioning well, with no dilatation or distortion of the collecting system. Three weeks after the ureters were transplanted, a cystectomy was done. At this point we decided that the case was inoperable, but since we were already committed, the operation was carried out. Examination of the specimen showed a large tumor in the diverticulum (fig. 9). Following this procedure, the patient got along very well, and was discharged from the hospital.

About two and one half months after the cystectomy he was brought back to the hospital because of edema of the lower extremities. At this time it was obvious that he had widespread metastasis to the lung and the liver, and he finally died from what appeared to be liver failure.

Comment: This case obviously illustrates a mistake in judgment as to the operability of carcinoma of the bladder. The decision was difficult to make prior to operation because of the fact that the tumor was in a diverticulum. In such cases it is not possible to tell by bimanual palpation just how extensive the tumor is, and there is always an associated infection in the diverticulum which makes the pre-operative diagnosis more difficult. Although this patient should not have had a cystectomy, the case illustrates a successful ureteral transplant by the mucosa-to-mucosa method, as is shown in the pyelograms.

Case 5

A 43 year old white man was admitted to the hospital with a history of frequent and painful urination for 10 years, which had prevented him from working. He was wearing a urinal (fig. 10). He had been drinking rather large quantities of whiskey and taking all the pain-relieving pills that he could get, both with and without a prescription, and every patent medicine which had any pain-relieving qualities. Examination revealed an emaciated white man, 43 years of age, with marked emphysema of the

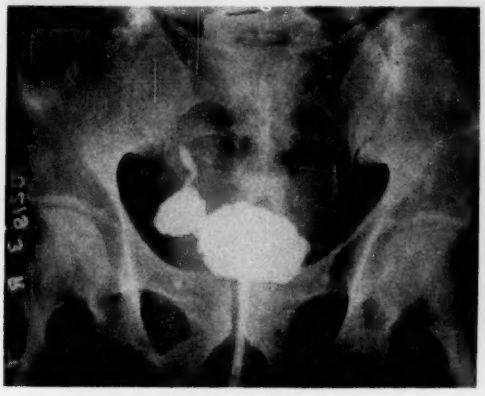

Figure 7 (Case 4)

Figure 8 (Case 4)

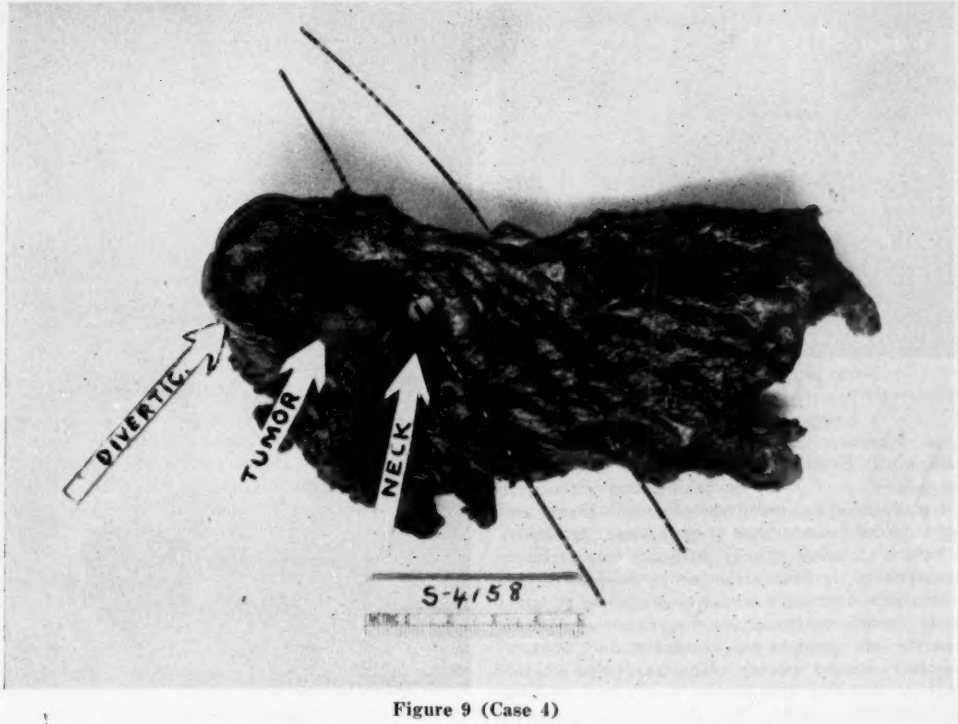

Figure 9 (Case 4)

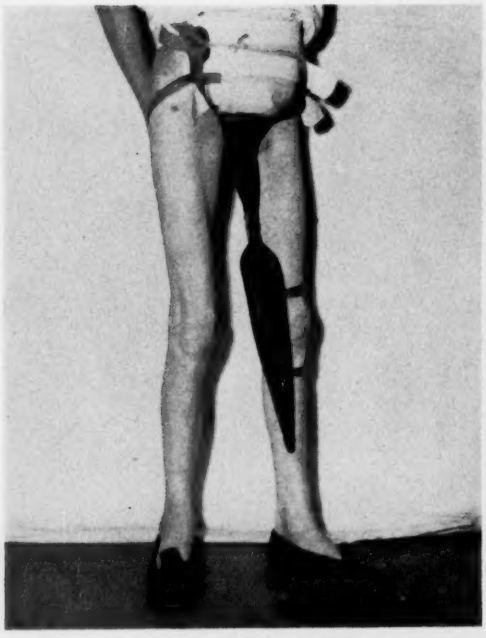

Figure 10 (Case 5)

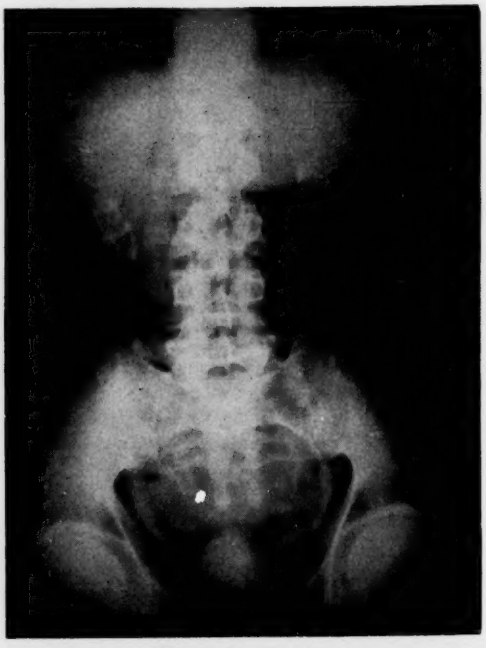

Figure 11 (Case 5)

Figure 12 (Case 5)

lungs. Otherwise the physical examination was not remarkable. Laboratory findings were within normal limits.

A urologic examination revealed both lower ureters to be markedly dilated (fig. 11), and his bladder to have a capacity of only 30 cc. It was virtually impossible to perform a cystoscopy because of this limited capacity, but a tentative diagnosis of interstitial cystitis with marked dimunition of bladder capacity was made. It was decided to do a bilateral mucosa-to-mucosa ureteral transplant, using a transverse incision (fig. 12), and the postoperative course was entirely uneventful. For the first day following

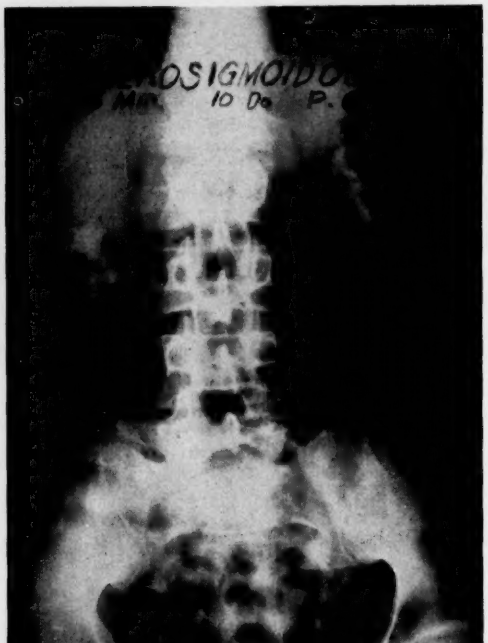

Figure 14 (Case 5)

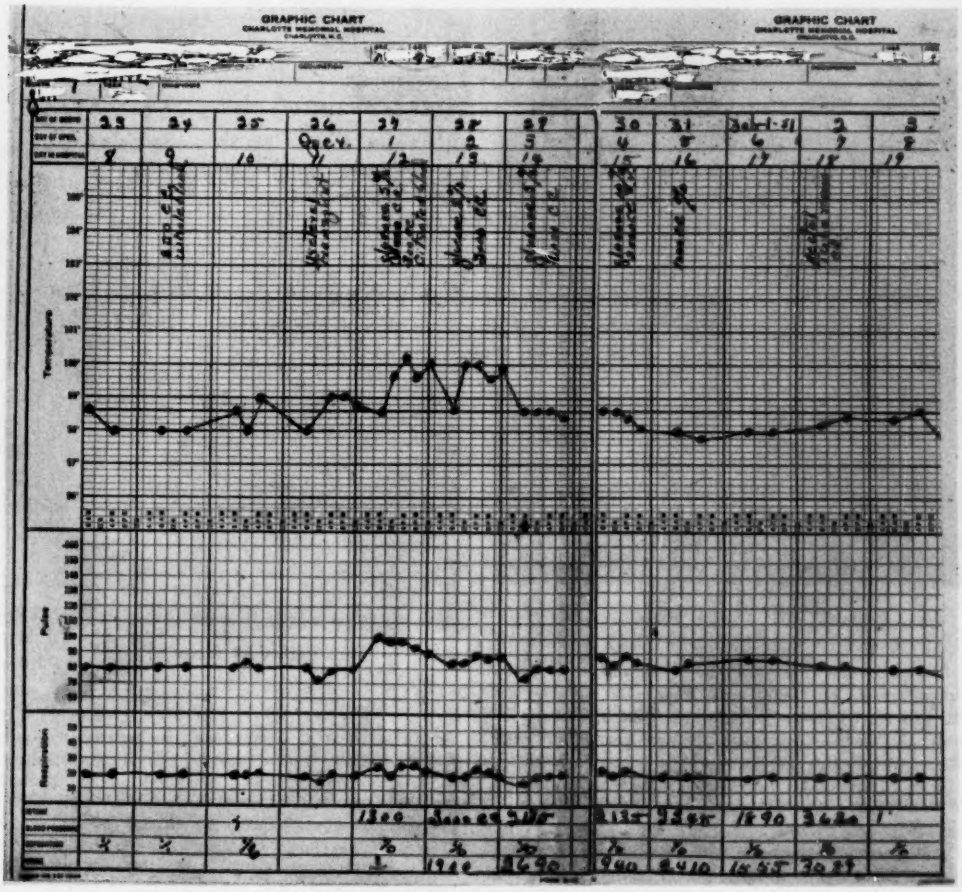

Figure 13 (Case 5)

the operation, the patient had a temperature of 100.1 F., which returned to normal the second day and remained normal thereafter (fig. 13). A section was taken from each ureter for histologic examination, and the findings of Dr. Paul Kimmelstiel, pathologist, were reported as follows: "Partially dilated ureters with extreme edema and fibrosis of the submucosa. Very mild ureteritis, nonspecific."

An intravenous urogram done 10 days following the operation (fig. 14) revealed both kidneys to be functioning normally, with no dilatation or distortion of the upper urinary tract. The patient was discharged from the hospital on the twelfth postoperative day, and has made an entirely uneventful convalescence. In about six weeks following the operation he was working at the regular job he had held prior to 10 years ago, and he is now doing well. He gets up about once during the night to urinate, or rather to empty his lower colon, and there has been no evidence of pyelonephritis since the operation. The blood chemistry has remained normal. Furthermore, the absence of pain has enabled him to gain weight and lead a normal life.

Case 6

A 58 year old Negro man was admitted to the hospital with a diagnosis of inoperable carcinoma of the bladder. General examination revealed a well developed Negro man, with a history of intermittent gross hematuria for about a year and a half. The physical examination was negative except for a firm, hard mass occupying the region of the bladder and the prostate, which was felt on rectal examination. Urologic examination revealed a fungating carcinoma filling about a third of the bladder, which on histologic examination was found to be grade four. The patient had undergone an autonephrectomy on the left side, because the carcinoma had cut off the ureter as it entered the bladder. Blood studies revealed that the nonprotein nitrogen was elevated to about 50 mg. per 100 cc. A urogram (fig. 15) disclosed a grade two hydronephrosis on the right side.

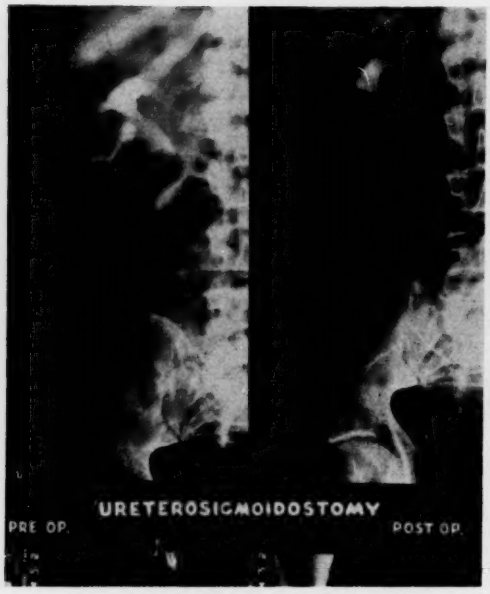

Figure 15 (Case 6)

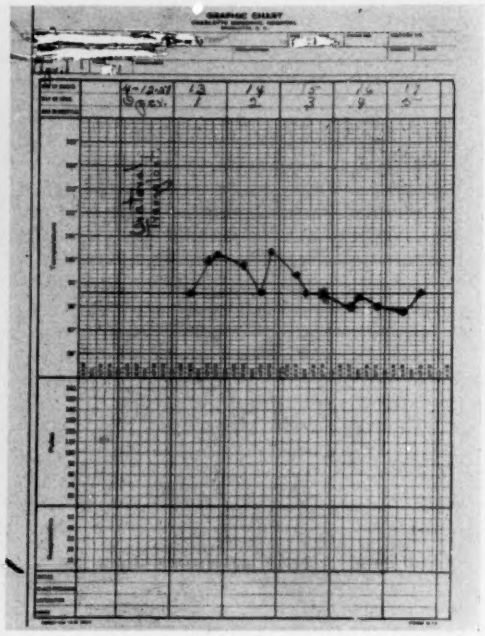

Figure 16 (Case 6)

It was decided to perform a palliative ureteral transplant on the right side, and to do nothing on the left side because of the previous autonephrectomy. A mucosa-to-mucosa ureteral transplant was carried out on the right, and at the time of operation a large carcinomatous mass was noted in the region of the bladder and prostate, extending up around the lower left ureter.

The patient's postoperative course was entirely uneventful. The temperature chart (fig. 16) shows that he never had an elevation above 100.4 F. There was no gastric distension, and the patient was out of bed on the third postoperative day. A urogram made 11 days after the transplant (fig. 15) disclosed no progression of the hydronephrosis. In the meantime, his nonprotein nitrogen had returned to 38 mg. per 100 cc. He was discharged from the hospital, feeling well, two weeks after the operation.

Comment: We believe that in a case of this type, in which the patient is bed-ridden and in constant pain, with bloody urine draining from him constantly, one is justified in trying some surgical procedure for relief, rather than relying on narcotics.

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Qualifications of a Surgeon: In general the successful surgeon should possess robust health, energy, and ability to make decisions under circumstances of stress. A measure of philosophic doubt is desirable together with a critical faculty which extends its operation to his own actions. I think a certain degree of optimism is an asset if a man is to remain undismayed and not discouraged by the occasional but inevitable failures in his work. Some seem to have developed an intuitive judgment—perhaps a natural endowment but also supported by the fruits of observation and criticism of past results. Joseph Conrad, in a generalization, gives, I think, a good picture of what is in my mind. "I don't mean the courage of self-assertion, either moral or physical, but the mere way of it, the trick of the thing, the readiness of mind and the turn of the hand that come without reflection and lead the man to excellence in life, in art, in crime, in virtue, and for the matter of that even in love."—Sir Max Page: Surgery, Brit. M. J. 2:437 (Aug. 25) 1951.

Courage: I have never got over my wonder at the way patients "take their medicine" in the bitterest sense of that word—their matter-of-fact acceptance of the disability and frustration caused by illness, and their bearing under pain. What has been publicized in regard to the courage of the wounded soldier in wartime is witnessed by us in everyday practice without comment. — Sir John Parkinson: The Patient and the Physician, Ann. Int. Med. 35: 310 (Aug.) 1951.

ALLERGIC MANIFESTATIONS IN OTOLARYNGOLOGY

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ASHEVILLE

Perhaps no field of medicine or surgery is so concerned with allergic conditions as otolaryngology, if one considers the huge number of otologic, rhinologic, and laryngologic disturbances which have an allergic foundation. It is evident that our hereditary background, environment, present manner of living, mental stresses and worries, and various occupational efforts play an ever present part in the reaction of the organism.

Allergy denotes an altered reaction of the tissue in certain individuals on exposure to agents which, in similar amounts, are innocuous to other people.

The modern history of clinical allergy began with a discussion of hay fever by Bostic in 1819[1], and later by John Elliotson[2] in England, who suggested that hay fever is caused by the pollen of grasses, and who also pointed out that nasal symptoms and asthma may be caused by animal emanations. In 1873, Blackely[3] performed the first skin tests for sensitivity to grasses. Allergy of the nose and paranasal sinuses was described as a catarrhal disease by Bosworth[4] in 1896. Nasal allergy, vasomotor rhinitis, was suggested by Langlois[5] in 1906, Billiard[6] in 1910, and Percipied[7] in 1912. Goodale[8], in 1916, was the first to confirm these reports.

The clinical aspects of allergy in relation to otolaryngology has made its most rapid strides in the last 30 years. Many surgical operations which have been devised and brilliantly executed for the correction of the underlying pathologic conditions in the head have left much to be desired in clinical end results, both to the surgeon and to the patient. The advent of antibacterials, such as the sulfonamides and antibiotics, in the treatment of infections about the head, has disclosed that conditions other than the infections are at work: such as an altered tissue reaction to an exogenous, endogenous, physical, or psychosomatic sources.

Pathology

Recent observations of Kline[9] show that allergic reactions are characterized by a rapid onset, a violent course, and a slow regression. The true reactions are variable and range from no alteration to inflammatory, proliferative, degenerative, and necrotic changes.

In the mucous membrane, the mucosa is boggy and either pale, as though covered by skim milk,—or pink, showing epithelial discoloration. Edema and polyposis may be present. Nearly a third of the patients with allergic rhinitis or perennial asthma have mucous polyps.

Steinberg[10], in his summary of histopathologic changes in the mucous membrane of the respiratory tract and accessory nasal sinuses, describes hypertrophy, increased secretory activity of the mucous glands, large amounts of mucus in the lumina, eosinophilia (in 15 to 90 per cent of all the cells), edema of the tissue, thickening and hyalinization of the basement membrane, with hyperplasia of goblet cells. The polypi are loose, with a jelly-like structure of the stroma and tunica propria, distended with serum, and two or more may coalesce, forming cysts. The edema of the mucous membrane may prolapse and form pedunculated polyps.

The microscopic picture shows numerous mononuclear cells, plasma cells, lymphocytes and, as a rule, eosinophilia. The absence of eosinophils does not rule out allergy, as a superimposed bacterial infection will result in a neutrophilic infiltration which later may go on to form connective tissue and fibrosis.

Kline and Young[11], in 1935, stated that tissue changes in allergy may be reversible or irreversible in type. In seasonal hay fever, repeated acute attacks as a rule are reversible. In long continued attacks, as in the perennial type of allergy, the reaction of the tissue is often proliferative and degenerative, and, though it may be partly reversible, is for the most part irreversible in character.

Allergy of the Ear

Allergy may involve the auricle, the external ear, the middle ear, the labryinth, the cochlea, and the eustachian tube. Allergic otitis externa is a dermatitis characterized by hyperemia, with inflammation, edema, and pruritus. In severe cases, there may be blister formations. In the chronic types, eczematoid changes may occur, with thickening and scaling of the skin. The lesions may be exudative or nonexudative.

Read before the Section on Ophthalmology and Laryngology, Medical Society of the State of North Carolina, Pinehurst, May 8, 1951.

The external ear

In infants, these eczematous types of lesions may appear on the external ear and postauricular areas, and may be a manifestation of contact dermatitis due to the localized sensitization to the various medicaments or foods. The most frequent offenders are the sulfonamides, penicillin, mercurial preparations, baby oil, nail polish, wave set lotions, spectacle frames; and in infants, the simple foods in the diet such as eggs, chocolate, wheat flour, the disaccharides, and the various starches.

Lesions of the external canal are usually due to contacts, and most frequently are complicated by bacterial or fungus infections. Such lesions may disappear when the contactant or offending food is eliminated.

The middle ear

In 1929, Lewis[12] reported 6 cases in which allergy was noted as a cause of an acute process in the middle ear; followed in 1931 by Proetz[13], who reported 10 cases of the same type. He noted instances of acute processes caused by food allergy in artificially fed infants and children under 5 years of age. Shambaugh[14], in a series of 100 cases of chronic otitis, noted eosiniphilia in 2. Albrecht[15] has found that 86 per cent of the cases of chronic otitis were in children who had been bottle fed, indicating, one must think, milk sensitivity in these cases. He expounded the theory that these patients were locally sensitized by regurgitating the foreign protein of milk through the eustachian tube into the middle ear. Dohlman[15] noted that certain conditions were associated with other allergic symptoms such as asthma and gastrointestinal disturbances. He confirmed Albrecht's theory, especially in regard to children who were congenitally predisposed to allergic diseases, and in those who were bottle fed.

Kuhn[16] outlined principal complaints of middle ear involvement, marked by fullness in one or both ears; deafness or dullness of hearing, frequently of the type combining high and low frequency, but principally of high frequency; dullness, deep-seated pain, with itching between the nose and the ear; and a burning sensation in the ear.This condition may be associated with fever, allergic rhinitis, and catarrhal serous otitis.

The serous otitis, provided there is no pre-existing nerve deafness, is of the conductive type. The drum membrane shows a loss of luster and is usually retracted, but may lose its markings from the collection of fluid and edema of the middle ear cavity. In the later stages of the disease the small vessels of the tympanum may be dilated, a meniscus, or a fluid line, and an amber discoloration may be seen. In both stages, abnormalities may be absent if the drum is not translucent and thickened.

In this type of case Hoople advises auscultation while inflating the ear with an eustachian catheter. If this is done, one frequently hears the gurgle of the air bubbles entering the middle ear, suggesting the presence of fluid. If in doubt, a diagnostic paracentesis should be done, and the resulting fluid examined for cytologic abnormalities.

The internal ear

Allergies affecting the inner ear present unilateral and bilateral hearing defects, which may be of the nerve type or conducive type of deafness, associated with tinnitus, vertigo, and clicking noises, especially when talking or swallowing.

Endolymphatic hydrops may be the result of intrinsic or physical allergies. Allergies of the cochlea and labyrinth frequently show the triad of a Meniere's syndrome—vertigo, tinnitus, and deafness. Due to the work of Hallpike and Cairns in England, and John Lindsay of Chicago, pathologic specimens examined and described show dilation of the endolymphatic system, with degenerative changes in the sensory element of the inner ear, in the absence of inflammatory changes. Frequently Meniere's syndrome is associated with other allergic manifestations such as myalgia, neuralgia, and sensitivity to food contactants and inhalants. Evidence (in the literature) indicating that Meniere's syndrome may be allergic in origin, is accumulating rapidly.

Kuhn[16], in a recent article, suggests that in cases involving the middle or internal ear a hearing test should be given and the audiogram repeated 20 minutes after a hyperdermic injection of one-half the therapeutic dose of epinephrine. If there is a change in the hearing and a subjective change in the feeling of the patient's ear, we can consider the allergic influence to be important enough to warrant investigation from an allergic standpoint. Positive nasal secretions that show an eosiniphilia or a blood eosiniphilia may be considered confirmatory.

Allergies of the Nose and Sinuses

In mild cases a tickling sensation in the nose may be the only symptom. In severe forms there may be itching, lacrimation, photophobia and itching of the eyes, ears, roof of the mouth, and the pharynx, accompanied by sneezing and nasal obstruction. The attack usually begins with profuse watering, anterior nasal secretions which later become mucoid but remain clear, resulting in frequent rubbing of the nose and excoriation about the alae. In long standing cases, the discharge may become mucopurulent and drain backward on to the posterior pharyngeal wall, giving the posterior tips of the turbinate a mulberry appearance, with hyperplasia of the islands of lymphoid tissue in the postpharyngeal wall and Waldeyer's ring, and thickening of the lateral bands of the pharynx. The septal mucosa is usually hypertrophied, and there may be a loss of the sense of smell and an alteration in taste.

Some patients complain only of postnasal discharge and a feeling of stuffiness in the nose. In children, persistent allergic bronchitis, frequently leading to asthma, may be the sole manifestation. In severe cases, there may be constant discomfort through the day and night, but the majority show daily periodic variations. Nasal blocking is more pronounced during the night, whereas the other symptoms become more pronounced on arising.

Patients with perennial rhinitis may show a sensitivity to seasonal excitants, including molds, foods, pollens, occupational dust, and fatigue.

Chronic sinusitis

Shambaugh[17] states that no more than one fourth of all cases of chronic suppurative sinusitis are of the anaerobic, nonallergic type. The great majority have an allergic basis in which chronic allergy of the nasal sinus mucosa is complicated by a superimposed infection. These are the cases that have caused nasal and sinus surgery to fall into a degree of disrepute, for as long as the underlying allergy is not suspected and likewise not controlled, recurrence of infections is frequent, despite the most complete and radical surgery.

The symptoms of an allergic chronic sinusitis are unusually severe and out of proportion to the virulence of the infection: the nasal blocking, accompanied by a profuse mucopurulent nasal and postnasal discharge; irritable cough, productive or nonproductive, with wheezing; intense headaches out of proportion to the general findings in the nose; and chronic fatigue. These patients would readily submit to radical surgery in an attempt to get permanent relief.

The physical findings and roentgen examination of the sinuses usually indicate bilateral pansinusitis and a thickening of the mucosa. These findings may vary on repeated examinations.

In cases of chronic allergic sinusitis where allergy is unrecognized and untreated, recurrences are the rule. Where the allergy is controlled, the prognosis is much better. The allergic individual will always be allergic and may be thrown out of allergic balance by fatigue, undue exposure to allergenic substances, or by infection.

Tonsillectomy and respiratory allergy

The close similarity of the symptoms of respiratory allergy to those of head colds, bronchitis, and sinusitis is ever present and confusing in a differential diagnosis. Many times, in repeated upper respiratory involvement, the removal of tonsils and adenoids is advised. In an analysis of 341 cases of respiratory allergy in children[18], it was revealed that a consideration of tonsillectomy was frequently the primary factor. It is felt that many patients with respiratory allergy, especially the perennial type, are subjected to tonsillectomy and adenoidectomy without recognition of the primary allergic manifestations. So often tonsillectomy is performed to relieve the symptoms of allergy, which are considered to be primarily of infectious origin.

Hansel studied 200 cases of respiratory allergy. One hundred and four of the patients were male and 96 female. The ages varied from 3 to 16 years. Twenty-six proved to have nasal allergy, an incidence of 13 per cent. Of the positive cases, the nasal symptoms were typical in only 13 instances.

Early respiratory allergy, manifested in frequent headaches and bronchitis, should be recognized. The removal of tonsils and adenoids for the relief of such symptoms should not be recommended.

Headache

On account of edema of the brain, the allergic type of headache is likely to be gen-

eralized rather than localized. When localized, it is usually confined to one or more of the sinuses, and is caused by pressure and obstruction to drainage produced by the allergic edema. Headache is usually associated with other manifestations of allergy, and is most frequently caused by sensitivity to food.

Typical and atypical histamine cephalalgias, on account of the localization over the frontal and maxillary sinuses, are usually on one side, and, because of the associated nasal discharge and obstruction, must be differentiated from allergy and acute or chronic sinusitis. With the inclusion of migraine and tension headaches, practically all the cases observed by the otolaryngologist fall into these four groups[19].

Involvement of the Salivary Glands

Recurring attacks of parotitis[20] or involvement of any of the salivary glands is often confused with mumps. Many of these cases may involve only one gland or multiple glands, and the swelling may be of short duration. Fever is usually absent. Pain is aggravated by movement of the jaw. The expression of the mucous plug from the duct often relieves this condition, which is believed by some workers to be due to a localized allergic reaction of the salivary gland.

Deafness

Deafness in children may be the result of edema of the eustachian tube, causing serous otitis of allergic origin. Crowe and Wazl[21] have obtained good results with irradiation, whereas Hansel[22] states that, regardless of the effect of radium on the lymphoid tissue, there is likely to be improvement of hearing, at least temporarily, as a result of the nonspecific effect of radiation on the allergic process. It is needless to emphasize, therefore, the importance of the recognition or exclusion of allergy as a factor in these cases.

Angioneurotic Edema and Serum Diseases

With the most recent accessories or the indiscriminate use of the antibacterials, including the sulfonamides and the antibiotics, the endocrine products, liver extracts, insulin, and other injectibles, the otolaryngologist should be concerned with the possible occurrence of a delayed or serum disease type of reaction which may appear from seven to ten days following the administration of these drugs. Patients to whom these drugs are administered should be warned of this possibility.

Nerve paralysis[23] as a complication of serum disease should be borne in mind. Reports in the literature have called attention to paralysis of one of the cranial nerves, especially involving the motor fibers. Those principally involved are the facial, the auditory, and the recurrent laryngeal nerves.

Other Manifestations of Allergy

Other manifestations of allergy are frequently present and must be considered in the management of the patient. A carefully taken history often elicits information relative to allergic bronchitis, bronchial asthma, urogenital allergy, gastrointestinal allergy, allergic headaches, and skin manifestations, such as contact dermatitis, eczema, purpura, urticaria, and angioneurotic edema.

History-Taking

In taking the history, one should record the most prominent symptoms, the date and time of year of onset, precipitating factors, the frequency and duration of the attack, and the months of the year in which these attacks occur. The latter is particularly important in cases of pollen allergy, as the tree season is in early spring, the grass season in late spring and early summer, the ragwood season in late summer and early fall, and the dust season in late fall and winter, especially when the heat is turned on. Airborne fungi are more prevalent in wet weather, from April to November.

The severity of the attack, whether it occurs when the patient is at home or at work, what relieves it, the freedom from symptoms between attacks, whether partial or complete, and other allergic symptoms such as hay fever and asthma, perennial rhinitis and urticaria, are important factors. The past medical history in relation to the development of allergic manifestations is likewise important. Recurrent bronchitis may follow one of the acute eczematous diseases, or asthma may follow tonsillectomy at the height of the pollen season. A positive family history should intensify the search for an allergic cause.

Identification of the allergens

The search for the allergens should begin with the *inhalents*. Among the possibilities to be considered are floor covering, furniture, contacts with animals, dust, feed or

fertilizer, and insecticides (used indoors or out), the location of the house, whether damp or dry, the heating system, and exposure to soaps, perfumes and cosmetics which may act as inhalants as well as contactants.

Any food which the patient thinks will produce his complaint should be recorded, and also any food that is intensely disliked. Food and diet must be considered in relation to itching of the palate, gas, canker sores, nausea and vomiting, constipation, or mucus in the stool. In some cases, a food diary must be kept in the search for the offending allergen. Information on the use of drugs such as laxatives, nose drops, analgesics, and hypnotics may be significant. Aspirin, phenolphthalein, belladona, and mineral oil are frequent offenders.

Allergens causing a contact dermatitis, such as poison ivy, garden flowers, vegetables and fruits, paints and sprays, furniture polish, waxes, soap, washing powder, cosmetics, lotions, wave sets, disinfectants, silk, and wool are some of the most common offenders.

Cytologic Study of Smears

Hansel's technique[24]

1. Collect secretion by having the patient blow nose on waxed paper.
2. Transfer secretion to slide—tease out with toothpick so as to avoid thick masses. Make two or three smears if there is enough material.
3. Dry smears in air or gently over flame.
4. Mark across slide next to lavel with paraffin stick to prevent overflow.
5. Cover completely with stain and allow to stand 30 to 45 seconds, allowing the longer period for thick or milky smears.
6. Add distilled water to take up stain, as in Wright's tecnique, and allow to stand about 30 seconds. For best results neutralize the distilled water by adding 1 drop of 1 per cent potassium carbonate to each 30 cc.
7. Pour off stain and flood slide with distilled water to remove excess stain.
8. Flood slide with 95 per cent ethyl alcohol. Drain off and dry slide over flame.
9. If the blue color is too intense, flood slide with 95 per cent ethyl alcohol to which 1 drop of 1 per cent hydrochloric acid has been added to 30 cc. The amount of blue color removed depends on the length of time the acid alcohol is allowed to remain on the slide.
10. Pour off the acid alcohol and then flood with plain 95 per cent ethyl alcohol again.
11. Always examine the stained smear under the microscope before using the acid alcohol solution. The acid treatment *intensifies the red in the eosinophils by removing overlying blue.* Too much acid may take the blue out of the neutrophils and give them a pink color. If the neutrophils are pink upon the first examination, stain another specimen and allow about 15 to 20 seconds longer for the stain to act before adding the water.
12. In examining smears, the magnification must be 125 to 150. Using a 10 x objective, the eyepiece should be 12.5 or 15 x. Use a moderately strong clear light.

Skin-Testing

The diagnostic skin test consists of introducing a minute quantity of a specific substance (allergen) into the skin by means of a scratch, or an injection[25]. If the skin already contains specific allergic antibodies (reagins) to this substance, the allergen immediately unites with the reagins. This union is accompanied by sufficient cellular damage of the skin to liberate histamine-like substances. Histamine causes capillary dilatation and increased permeability, with a wheal surrounded by erythema. The size of the wheal corresponds roughly to the amount of allergen introduced and the amount of reagin in the skin.

A number of factors conspire to make skin testing inaccurate and frequently unreliable for diagnosis.

1. Allergic antibodies may be present in the nose, bronchi, intestinal tract, or localized tissue, but not in the skin, causing the skin test to be "falsely negative."
2. Conversely, allergic antibodies may be present in the skin but not in the nose, bronchi, or intestines, causing the skin test to be "falsely positive."
3. The degree of clinical sensitivity is not necessarily mirrored in the degree of reaction to the skin test.
4. A thick, scarred or sunburned skin will react poorly.
5. The skin testing material may be inert, either through deterioration or improper preparation.
6. If the patient has taken adrenalin or an antihistamine, the skin tests may be falsely negative.

7. Food tests are falsely negative in 20 per cent of cases, as compared to tests with inhalants, which are falsely negative in only about 10 per cent of cases.

As stated above, positive skin tests to inhalants are more significant, as a rule, than positive or negative tests to foods.

If the history does not correspond to the results of the skin tests, as a rule the tests should be disregarded and the patient should be treated in accordance with the history. As a general rule, the rhinologist experienced in allergic diagnosis is able to arrive at a satisfactory diagnosis of the specific allergen with comparatively few skin tests, selected in accordance with the history. Most patients will require no more than 20 to 50 skin tests, and rarely will more than 100 or 150 tests be needed for diagnosis.

Diagnosis

Accurate diagnosis of allergy in otorhinolaryngology involves the careful consideration and correlation of the following points[26]:

1. *Symptoms:* The typical symptoms of sneezing, itching, nasal discharge, and obstruction are easy to recognize. Atypical cases, however, characterized by stuffiness and postnasal discharge, with little or no sneezing, should not be overlooked. Frequently recurring colds, particularly in children, must be differentiated from allergy.

2. *Nasal changes:* Although the typical allergic mucosa is characterized by pallor, bogginess, and sometimes edema or polyposis, there are many instances in which the mucosa appears normal or somewhat reddened.

3. *Cytology of the Secretions:* Nasal secretions and, when available, sinus secretions should be stained and examined microscopically for eosinophils, neutrophils, or both. The cytologic picture is frequently the most important factor in diagnosis. It must be emphasized that the common cold is an ever present complication, and cytologic findings are the most important guide in its recognition.

4. *Roentgen examination of the sinuses:* Varying degrees of cloudiness are the rule rather than the exception in allergic sinuses. Changes may be of short duration and transitory. A cloudy sinus, therefore, does not always indicate infection. Roentgen findings should be correlated with the cytologic picture and bacteriologic cultures.

5. *Bacteriology:* Nasal cultures are unreliable because of contamination. Sinus cultures must be taken under strict aseptic precautions in order to avoid contamination. The findings should be correlated with the cytologic picture, and acute, subacute, and chronic complicating infections should be carefully evaluated.

6. *Histopathology:* All tissues removed from the nose and paranasal sinuses should be examined routinely, and the findings correlated with all the diagnostic factors already enumerated.

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DISEASES OF THE LARYNX: A PHOTOGRAPHIC STUDY

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The development of laryngeal photography has been intimately associated with the discovery of the laryngoscope and the development of both indirect and direct laryngoscopy. Prior to the invention of the laryngoscope, the larynx, for all practical purposes, occupied the status of an internal organ, defying direct visualization as effectively as do the hidden contents of the chest, abdomen, and cranial cavity. The diagnosis of laryngeal disease was of necessity made from symptoms only. The early history of the laryngoscope and its use in the study of laryngeal physiology and pathology have been ably recorded by Mackenzie[1], Wells[2], Goldsmith[3] and others. The historical facts presented herewith were gleaned for the most part from the writings of these authors.

The Development of Laryngoscopy

Garcia, Turck, and Czermak

Before 1946 credit for the discovery of the laryngoscope was generally given to Manuel Garcia, and priority for its use in medical practice was attributed to Ludwig Turck of Vienna and Johann Czermak of Budapest.

Garcia was not a physician but an eminent teacher of voice, who conceived the idea of studying the action of his own vocal cords and those of his students in order to improve his methods of teaching and to advance the science of voice-teaching in general. In order to accomplish this, he secured from an instrument maker a small mirror fixed to a long stem. His procedure consisted of placing the mirror into his own pharynx or that of his pupil and reflecting the light of the sun's rays into the throat by means of a hand mirror. So far as is known he was the first to practice auto-laryngoscopy. Garcia's observations were limited to the normal larynx, and his paper published in 1855 contained an excellent account of the action of the vocal cords during inspiration, vocalization, and the production of sound in the larynx[4].

In 1857 Turck secured one of Garcia's mirrors and attempted to study the larynxes of patients in the Allgemeines Krankenhaus of Vienna. However, he did little to improve on Garcia's mirror or methods. In the same year Czermak began to work with one of Turck's laryngeal mirrors, and soon overcame many of the difficulties associated with its use. He substituted artificial light for the uncertain light of the sun, used the large ophthalmoscopic mirror of Ruete to concentrate the light rays, and made mirrors of different sizes. The mirror for reflecting light was held between the teeth by means of a projecting attachment, and it is said that a student of Czermak's, Dr. Semiledder, first suggested fixing it to the forehead by means of a spectacle frame. Turck, in turn, adopted Czermak's methods, and beginning his clinical studies anew, accomplished more in the field of laryngoscopy than did Czermak. The latter, however, received more recognition for his work, since he travelled about Europe demonstrating and propagandizing the new method of studying laryngeal diseases. The first publications of these two authors appeared in the same year one month apart. Unfortunately, a bitter dispute arose between the two men regarding priority in the development of the field of laryngology, and the French Academy of Sciences, being unable to decide the issue, divided the award between them.

Babington's priority

Thus matters stood until 1946, when Wells[2] brought forth what appears to be irrefutable evidence that the first person to invent the laryngoscope and use it in medical practice was Benjamin Guy Babington of London. Wells pointed out that similar conclusions regarding Babington's priority had been previously reached by Windsor in 1863, Mackenzie in 1864, Goldsmith in 1924, and Panconcelli-Calzia of Germany in 1935. Mackenzie's publication which had been previously overlooked by historians, constitutes one of the strongest links in the chain of evidence marshalled by Wells in favor of Babington's priority.

According to Wells[2], Babington described an instrument for examining the larynx before the Hunterian Society of London, March 18, 1829. An account of his report is to be found in the London Medical Gazette of 1829 (volume 3, page 555).

Read before the Section on Ophthalmology and Otolaryngology, Medical Society of the State of North Carolina, Pinehurst, May 8, 1951.

From the Kinston Clinic, Kinston, North Carolina.

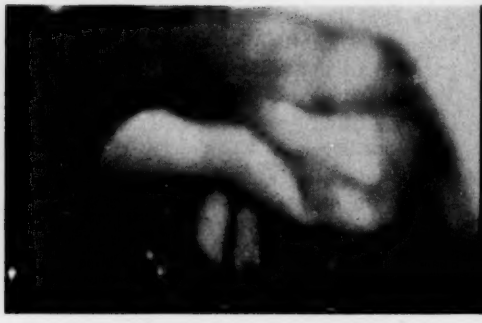

Fig. 1. Normal larynx during phonation.

Fig. 2. Acute cellulitis of the epiglottis.

"Dr. Babington submitted to the society an ingenious instrument for examination of the parts within the fauces not admitting of inspection by unaided sight. It consisted of an oblong piece of looking glass set in a silver wire with a long shank. The reflecting part is placed against the fauces whilst the tongue is held down by the spatula when the epiglottis and upper part of the larynx become visible in the mirror. A strong light is required and the instrument should be dipped in water, so as to have a film of fluid upon it when used or the halitus of the breath renders it cloudy. The doctor proposed to call it the 'glottiscope.'"

The only contemporary notice of Babington's invention was made in a lecture by Hodgkins at Guy's Hospital, in which he referred to the "ingenious invention of my friend, Dr. Babington, a speculum laryngis, or the laryngoscope." The speculum which formed a part of the first laryngoscope was omitted in later models. Babington devised the laryngoscope while still a medical student, and he subsequently rose to a position of eminence as a physician and scholar.

The previously overlooked medical paper mentioned above was presented by Mackenzie before the Royal Medical and Surgical Society on April 26, 1864. On that occasion he presented instruments designed by Babington which bore the name of the original instrument maker, and produced invoices for their sale. At this meeting a Dr. Streeter testified that Babington had used the laryngeal mirror in medical practice for several years, and Dr. Gibbs stated that he had used it on him personally from 10 to 12 years before (1848-1850).

The Development of Laryngeal Photography

It naturally follows that once the larynx was visualized someone sooner or later would manifest a desire to photograph it. The early history of the development of laryngeal photography has been well recorded by Clerf[5] and the more recent history by Holinger[6].

Early experiments

In 1860 Johann Czermak showed some interest in the problem of photographing the larynx, and later so did Solis-Cohen, Elsberg, French, and others. Czermak and French published papers on the subject, but their results were far from satisfactory. Stein of Frankfort-on-the-Main described a procedure for photographing the larynx in his book on *Light*, but no actual photographs accompanied the description[7].

In 1883 Lennox Browne presented the first successful photographs of the larynx before the British Medical Association[7]. In this work he had the assistance, among others, of Mr. Emil Behnke, a lecturer on vocal physiology and voice production in London. The photographs consisted of still pictures of Mr. Behnke's larynx during vocalization. No photographs of laryngeal abnormalities were made, and indeed Browne was very pessimistic about the future of laryngeal photography in this respect.

In 1884 Thomas R. French[8] of Brooklyn read a paper on laryngeal photography before the Section on Laryngology of the International Medical Congress held in Copenhagen, Denmark. He presented two portfolios of excellent still pictures of both normal and diseased larynxes. Portfolio 1 contained 41 photographs of normal and diseased larynxes from 24 subjects, and three photographs of the posterior nares of one subject. The pathologic conditions included chronic catarrhal laryngitis, chronic hypertrophic laryngitis, paralysis of the arytenoideus muscle, swelling of the tissues overlying the arytenoideus muscle in laryngeal

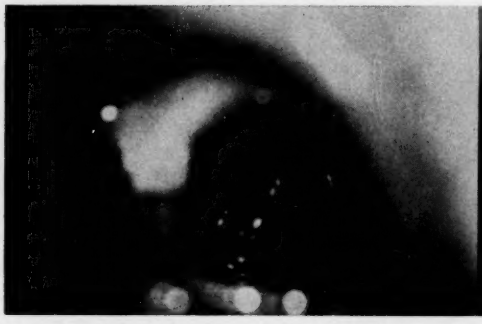

Fig. 3. Tuberculosis of the larynx (vocal cord and epiglottis.

Fig. 4. Small retention cyst on the anterior surface of the epiglottis.

phthisis, and papillomatous growths in the larynx. Portfolio 2 contained four series of photographs showing the positions of the various structures of the larynx in the production of tones in the different registers of voice.

This paper represented the culmination of two years of work in laryngeal photography, in which the author was ably assisted by Mr. George Brainerd, a civil engineer and skilled amateur photographer. About 1500 exposures were made before satisfactory results were obtained. The author used the sun's rays as a source of illumination, and a concave head mirror for reflection of the light. The simplicity of the apparatus is amazing. Later improvements in the technique and apparatus were made[9]. In contrast to Lennox Browne, French was very optimistic about the future of laryngeal photography as a practical means of studying laryngeal pathology.

No further progress was made in photographing the larynx until Garel of Lyons, France, devised an apparatus for making stereoscopic pictures of the larynx. His work was published in 1919, and was a definite contribution to the subject[10]. In 1923 Clerf began to use the Garel camera, and presented the results of his work in 1924[11]. While this method gave the best results that had been obtained up to that time, the difficulties of illumination with the available materials were so great that Clerf was forced to abandon this line of approach as impracticable.

Rapid advances

In the following 10 years the introduction of the small motion picture camera, the development of faster films, the manufacture of more compact and more powerful electric light bulbs, and the introduction of color film paved the way for faster progress in laryngeal photography. Black and white film gave satisfactory results in depicting motility of the larynx, but the later use of color film aided immeasurably in revealing pathologic changes in the larynx.

Up to 1930 no successful movies of the larynx had been reported. In that year Russell and Tuttle[12] presented small colored pictures of the normal larynx in motion, which they obtained by an apparatus of their own device, the "fonofarynskop." The authors stated that while previous attempts to make moving pictures of the larynx had been made by others, the results were only partially successful, the most noteworthy being those of Calzia and Hegener.

In 1931 Heatley[13] reported on cinematographic studies of the normal and diseased larynx secured by direct laryngoscopy using a quartz rod as the source of illumination. This was the first recorded attempt to photograph the larynx by direct laryngoscopic procedure. The results were commendable, but there was inadequate illumination to secure clear definition and focal depth.

About 1922 LeJeune experimented with the Garel camera, but abandoned the method as impracticable. In 1933, having been stimulated by the previous efforts of Lynch in the field of laryngeal photography, he presented moving pictures of the larynx made with the suspension apparatus[14]. In 1936 he reported on further observations and the use of color film in depicting laryngeal lesions[15]. His contributions to the subject made him preeminent as a pioneer in laryn-

Fig. 5. Inflammatory polyp of the vocal cord.

Fig. 6. Ulcerative carcinoma of the epiglottis, with marked inflammatory reaction of the vallecula.

Fig. 7. Bilateral paralysis of the vocal cords.

Fig. 8. Foreign body (chicken bone) in the larynx.

geal photography, and stimulated interest in both direct and indirect laryngoscopic methods.

Photography by direct and indirect methods

In 1937 Pressman and Hinman[16] presented a simple technique for photographing the larynx by the direct laryngoscopic method. Adequate lighting for color photography was secured by providing the laryngoscope with twin light carriers. This principle of lighting was subsequently modified by others and is now generally accepted for photographing the larynx by direct means.

In 1939 Tucker[17] and Lell[18] presented movies of the larynx made by indirect laryngoscopic method. The larynx was visualized in the customary manner by the laryngologist, and photographed by an assistant who operated the camera independent of the source of illumination. In the same year Soho and Fineberg[19] reported on a simplified apparatus for direct laryngeal photography using 8 mm. film and standard equipment.

In 1940 Lierle and Kent[20] reported their results obtained with colored photographs of the larynx using the Lynch suspension apparatus, and in the same year Pressman and Hinman[21] recorded further advances in their technique of photographing the larynx.

Some of the most instructive films depicting laryngeal physiology ever produced were taken by the indirect laryngoscopic method, with a very high speed motion picture camera developed by the Bell Telephone Laboratories[22]. The results of these studies were presented by Farnsworth in 1940[23]. Observations on the physiologic sphincter action of the larynx were reported by Pressman in 1941[24].

Jackson and Norris[25] synchronized laryngeal films with the sound produced to demonstrate the effects of lesions of the larynx on the voice. The results were presented in 1941.

Clerf, with the technical assistance of Mr. J. W. Robbins, devised an apparatus which could be used in the office for photographing

the larynx by mirror laryngoscopy. The light delivered to the larynx by this apparatus was of such a degree as to permit a decrease in the size of the diaphragm opening, thereby increasing the focal depth. The results of their work were reported in 1941[5]. The apparatus has subsequently been improved, and the results obtained with its use are excellent.

The principles underlying photography of the larynx have been well outlined by Clerf[5]. However, the adjustment of the apparatus and the actual process of photographing the larynx can be learned only by experience. It is not an easy technique to acquire, and not every larynx lends itself to photography.

Figures 1 to 8 depict illustrative examples of inflammatory, benign, and malignant diseases of the larynx. A case of foreign body in the larynx has also been included.

Summary

The history of the discovery of the laryngoscope (laryngeal mirror) and the development of the field of laryngeal photography have been reviewed.

It is concluded that photography of the larynx is unexcelled as a medium for teaching and studying laryngeal physiology and pathology.

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ACUTE INTERSTITIAL MYOCARDITIS ASSOCIATED WITH CARCINOMA OF THE BODY OF THE PANCREAS

Report of a Case

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The case presented here is believed to be an instance of acute interstitial myocarditis associated with carcinoma of the body of the pancreas.

Myocarditis

Acute interstitial myocarditis is also known as Fiedler's myocarditis[1], idiopathic myocarditis, and "isolated myocarditis"[2]. It is classified by Saphir as one of the four general categories of myocarditis[3], and is said to be very rare and of an obscure nature, having been found only 43 times in a series of 1,402 cases of myocarditis[4].

Two types of acute interstitial myocarditis have been described. The more common is the diffuse type, which is characterized by diffuse, inflammatory changes in the cardiac muscle, with infiltrations of lymphocytes, mononuclear cells, eosinophils, plasma cells, and a few neutrophils[2]. The process tends to produce fibrosis[1]. In the less common, granulomatous type, there are small nodules with giant cells and caseation, somewhat resembling tuberculous foci[2].

Grossly, acute interstitial myocarditis may show cardiac dilatation[5].

From the Department of Pathology, the Department of Medicine, and the Department of Physiology and Pharmacology, of the Bowman Gray School of Medicine of Wake Forest College and the North Carolina Baptist Hospital, Winston-Salem, North Carolina.

The clinical diagnosis is rarely made correctly. Symptoms include precordial pain, fever, tachycardia, diminished systolic blood pressure, cardiac enlargement, systolic murmurs, and heart tones of poor quality. Congestive failure may occur[6].

The etiology is unknown[6b]. In a few cases the sulfonamides have been implicated[7]. Other possible etiologic agents have included burns and "toxemias." In experimental animals myocardial injury due to the effect of sparteine and epinephrine has been demonstrated[2].

Pancreatic Relationship

Cardiac complications of carcinoma of the body of the pancreas have been reported[5b]. Leach mentions the findings of coronary thrombosis in one of his cases of carcinoma of the pancreas; in another of his cases there were "marked myocardial changes," but he does not state whether this was a case of myocarditis[8].

In examining the recent literature the authors have not encountered any report of acute interstitial myocarditis associated with carcinoma of the body of the pancreas.

Carcinoma of the Body of Pancreas

Carcinoma of the body of the pancreas accounts for about 1 per cent of all deaths from cancer[1]. It was encountered 14 times in 14,000 autopsies[9]. These tumors are usually adenocarcinomas, having a gland-like structure or seeming to arise from the ducts; their cells have an anaplastic appearance[1].

It is noteworthy that in carcinoma of the body of the pancreas (including the tail), pain is often an early and important symptom, whereas jaundice does not appear until quite late[10]. In one series, pain was the initial complaint in 70 per cent of the cases[10a]. The pain is usually epigastric, and tends to radiate to the right, left, or directly backward[10, 11c]. It is usually dull, aching, and of a boring nature[9, 10c]. Other symptoms include weight loss, weakness, and gastrointestinal disturbances[10a, b].

Among the symptoms of carcinoma of the body of the pancreas, multiple venous thromboses are a late but unexplained finding. They occurred as a late symptom in about one third of the cases in several series[1, 10a, 11]. The veins involved are said to include especially the subclavian and great saphenous veins, the inferior vena cava, and the iliac, splenic, portal, and mesenteric veins[11b]. Gross, Jaehning, and Coker, in reviewing the literature, found that of 56 cases of carcinoma associated with migrating thrombophlebitis, 33 were pancreatic carcinomas[13].

Although the reason for the high incidence of multiple venous thromboses with carcinoma of the body of the pancreas has not been explained, it has been postulated that these neoplasms may secrete an excessive amount of substance normally produced by the pancreas and involved in the blood-clotting mechanism, or that perhaps they give rise to an abnormal substance which hastens clotting[11b]. It has also been suggested that the increased lipase secretion influences coagulability of the blood by more efficient digestion of fats and absorption of fat-soluble vitamin K[12a].

Report of Case

A 73 year old man was admitted to the North Carolina Baptist Hospital, December 3, 1949, complaining of exertional dyspnea and epigastric pain.

The patient stated that he had had occasional attacks of "asthma" for several years; however for a number of months prior to admission, he had had increasingly severe exertional dyspnea. This had become so marked that even talking made him short of breath. He had developed a cough which was productive of about half a cup of white, tenacious sputum each day. Nitroglycerine had been used in an attempt to relieve the discomfort.

The epigastric pain had been present for at least 10 years. Originally it had occurred chiefly before meals, and was usually relieved by taking food. About a year before admission, however, it had become more constant, and was no longer relieved by ingestion of food. He had lost 15 pounds of weight in six months. There had been occasional tarry stools for a year or two, but no change in bowel habits. Shortly after the alteration in the character of his epigastric pain had occurred, roentgenograms of the stomach, duodenum, and gallbladder had been made. These had shown no abnormalities.

Eighteen months before admission the patient had received sulfadiazine and penicillin as treatment for urinary tract disease. At that time his blood pressure was 150 systolic and 84 diastolic. An electrocardiogram showed sinus tachycardia, first degree atrioventricular block, left axis deviation, and evidence of myocardial disease.

Physical Examination: On admission the oral temperature was 101 F., the pulse rate was 88, respirations were 20 to 26 per minute, and blood pressure was 106 systolic, 78 diastolic. The patient was a thin, deaf, elderly, white male who appeared chronically ill and apprehensive. His skin was warm, dry, inelastic, and showed evidence of recent weight loss. The retinal arterioles showed moderate sclerosis. The heart tones were of fair quality, but there was a grade II apical systolic murmur. Percussion of the lungs revealed dullness in the left base. There were moist inspiratory rales over the lower two thirds of the right posterior lung field, and over the lower half of the left posterior lung field. Occasional wheezing rhonchi were heard. Vocal and tactile fremitus were normal.

The abdomen was poorly relaxed, and there was tenderness in the epigastrium. The liver was palpable 3 cm. below the right costal margin. No other masses were palpated in the abdomen. Large, par-

tially thrombosed hemorrhoids were present. The remainder of the physical examination was not significant.

Laboratory Findings: The hemoglobin was 14 Gm. per 100 cc., and the leukocyte count was 28,200 per cubic millimeter. Serologic tests for syphilis were negative. The urine showed no significant abnormality. The blood nonprotein nitrogen was 38 mg. per 100 cc.; serum chlorides were 92 milli-equivalents per liter. Sputum culture revealed alpha-hemolytic streptococci, **Neisseria catarrhalis**, and a few beta-hemolytic streptococci.

Roentgen films of the chest were suggestive of diffuse, bilateral bronchopneumonia, but it was stated that the possibility of metastatic carcinoma could not be ruled out. Examination of the large intestine by barium enema showed no significant findings.

Course in Hospital: The patient was given 400,000 units of procaine penicillin intramuscularly on admission, and 300,000 units daily thereafter. He was digitalized with digitoxin. Although fever diminished, the pulse rate increased, and the patient complained of weakness and substernal pain.

On the fourth hospital day, his pulse rate reached 120 per minute, and he became quite dyspneic, presenting a shock-like picture. A transfusion of 500 cc. of group A, Rh negative whole blood was administered intravenously without immediate reaction. The patient was placed in an oxygen tent and was given theophylline with ethylenediamine intravenously. An electrocardiogram was interpreted as being suggestive of myocardial infarction with intramyocardial block.

The next day a second electrocardiogram was interpreted as being suggestive of a posterior infarction of the myocardium. A few hours later the patient suddenly became cyanotic. The blood pressure could not be obtained, and heart tones could not be heard. Respirations were of a rapid, gasping character. The patient was given nikethamide, artificial respiration, and suction, but expired about 10 minutes after onset of the cyanosis.

Autopsy findings

At autopsy, the heart weighed 525 Gm. Its surface was of a uniform dark, reddish-brown color, showing a moderate amount of epicardial fat. All chambers of the heart were filled with postmortem, currant-jelly clots. All four valve rings were dilated, especially the mitral, suggesting valvular incompetency. The aortic cusps showed some thickening and calcification, particularly along their free margin. The coronary ostia were patent. The coronary arteries showed moderate atherosclerosis, with narrowing of their lumina. The coronary vessels, however, were patent throughout. The wall of the left ventricle measured 18 millimeters in diameter, while the wall of the right ventricle measured 6 millimeters in diameter. The cardiac muscle throughout was of a homogeneous, dark reddish-brown color, markedly firm in consistency, and showed no localized gross lesions.

Microscopically, the myocardial fibers were enlarged, and the cells had an increased transverse diameter, with hyperchromatic nuclei which showed squaring of their ends. The capillaries and small arterioles were dilated and filled with erythrocytes. Some of the muscle fibers contained golden and yellowish tan pigment, resembling hemosiderin. In some places, there was degeneration of the myocardium, with replacement by fat. In many areas there were focal infiltrations of lymphocytes and polymorphonuclear leukocytes. The coronary arteries showed no thromboses. It is believed that the cardiac findings are those of acute interstitial myocarditis, with fatty degeneration and infiltration of the myocardium.

The pancreas was enlarged and quite irregular. It weighed 250 Gm. Arising from the body of the pancreas was a very large, firm mass approximately 6.5 cm. in diameter, which had replaced approximately two thirds of the pancreas. Multiple sections made through the pancreas revealed this large, central mass to be a roughened, irregular tumor, which cut with the gritty consistency of an unripe pear, and was grayish white in color. Milky material exuded from its cut surface. Microscopically, the tumor had an alveolar pattern, made up of duct-like structures. The cells were of tall, columnar epithelial type, with hyperchromatic nuclei. There were marked variations in the size, shape, and staining properties of the cells. Some areas appeared quite anaplastic. Portions of the cytoplasm of the cells appeared to be producing mucoid material.

A similar type of tumor tissue was seen in the lungs, liver and spleen, and in the mesenteric, preaortic, and regional lymph nodes.

It is probable that the pancreatic carcinoma was the primary lesion and the myocarditis the immediate cause of death.

Comment

It seems quite possible that these two conditions —acute interstitial myocarditis and carcinoma of the body of the pancreas—occurred together fortuitously in this patient. However, one is tempted to speculate whether there was some etiologic association, and whether the recognized tendency of carcinoma of the body of the pancreas to produce multiple thromboses may have played some part.

Pathologically, the picture is one of an inflammatory reaction in the myocardium rather than one of a thrombotic or infarctive process. Careful examination of the heart, both grossly and microscopically, has revealed no evidence of thromboses, either arterial or venous.

If the association is fortuitous, then this is merely an interesting coincidence. If there is a hidden etiologic relationship, however, the presentation of this case may stimulate further interest in this connection and possibly lead to the clarification of other similar unreported cases.

Summary

It is believed that this case represents the occurrence of acute interstitial myocarditis in association with carcinoma of the body of the pancreas. The question is raised as to whether the association of the two conditions is coincidental, or whether there is an etiologic relationship.

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THUMBNAIL SKETCHES OF EMINENT PHYSICIANS

LEGAL DIFFICULTIES OF EARLY NORTH CAROLINA PHYSICIANS

DOROTHY LONG

LEXINGTON, KENTUCKY

Among the early physicians of eastern North Carolina were several whose ideas and practices, progressive for their time, seem to have involved them in legal difficulties. In a description of eighteenth century New Bern, A, T. Dill, Jr.,[1] mentions Dr. Andrew Scott, who was apparently attempting at that time to inoculate patients for smallpox. Dill quotes the court minutes of 1759, the August session, in which a witness was summoned to answer questions "concerning Dr. Andrew Scotts sending to him for some Small Pox Skabbs in a vial." As there are apparently no further references to the matter, one cannot be sure that Dr. Scott did inoculate any patients, though it seems probable.

Almost 40 years later, at Edenton, two other doctors were accused of the same offense. J. B. Cheshire, in *Nonnulla*[2], gives extracts from a manuscript copy of a bill of indictment drawn by Blake Baker, attorney, in 1798, to be laid before the grand jury in the Edenton district, in which "the Jurors for the State upon their oath present, that Frederick Ramake, late of the town of Edenton, Practitioner in Physic and Surgery, and John Beasley, late of the same place, also Practitioner in Physic & Surgery, on the fifteenth day of February, in the year of our Lord one thousand seven hundred and ninety-eight . . . at the dwelling house of a certain Wilson Newbern . . . unlawfully and injuriously did uphold, maintain and keep a certain house and place for the reception and entertainment of persons laboring under a certain dangerous and infectious distemper called the Small pox . . . and continuously afterwards until the first day of April in the year aforesaid, with force and arms in the County and in the district aforesaid, unlawfully and injuriously did inoculate and cause to be inoculated divers persons . . ." The indictment continues to describe at some length the state of alarm aroused in the people of Edenton, and concludes that the action of the two doctors was "to the great damage, danger & nuisance of the inhabitants of the said Town, & the vicinity thereof, to the evil example of all others in like case so offending, and against the peace and dignity of the State."

No records of any trial were found by Cheshire, so it seems probable that the doctors were not tried, or at least were not convicted of any offense. At any rate, the incident evidently had no effect upon the reputation of one of them, if the Dr. Frederick Ramcke who died in Edenton on July 29, 1800, was the same person as the Dr. Ramake mentioned above, which seems almost certain, despite the slight difference in the spelling of his name in the two accounts. D. L. Corbitt, in the *North Carolina Historical Review*[3], has reprinted the obituary of Dr. Ramcke, which appeared in a contemporary periodical, the *Post-Angel, or Universal Entertainment*, of September 10, 1800. This eulogistic account says that the doctor, "by the gentleness and suavity of his manners, his skill and application in the medical art, the friendliness and hospitality of his disposition, justly merited and acquired the affection and esteem of everyone. His death must be regretted as a loss to the public, in being bereaved of the services of a man of unblemished morals, untainted integrity, and singular probity and goodness. He grudged not his trouble in visiting the sick, and his heart was too good to let him see the distress of his fellow creatures, without offering a willing hand to relieve them."

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"The prime object of the medical profession is to render service to humanity; reward or financial gain is a subordinate consideration. Whoever chooses this profession assumes the obligation to conduct himself in accord with its ideals."—Principles of Medical Ethics of the American Medical Association, Chapter 1, Section 1.

MARCH, 1952

SHORTER SCHOOL DAYS FOR THE FIRST GRADE

Twenty years ago the Forsyth County Medical Society was instrumental in having the school day for the first three grades in the Winston-Salem city schools shortened by one to two hours. Since then the first grade has had a four hour day—from 8:30 to 12:30.

Most parents, teachers, children, and physicians have been well pleased with this schedule. Recently, however, the State Department of Public Instruction has been bringing pressure to bear upon the Winston-Salem school authorities to lengthen this day, on the ground that: "During the past few years, there has been a definite trend toward making the primary school day longer and more informal in nature. The desirable modern first grade program of work is a relaxed one, including work, play, rest, food, and other natural everyday activities of young children. Our present four-hour schedule does not provide for unhurried participation in all of these activities. Some of us believe that our children and teachers are now working under considerable strain and tension and that a little more time would be welcomed."(1)

A plain, blunt parent may be pardoned for wondering just how keeping a six year old child in school from five to six hours would relieve his "strain and tension." Certainly the time actually required for his studies is not nearly four hours. Some years ago this journal(2) told of a six year old child kept in bed by a long illness whose parents employed a first grade teacher to spend an hour or less each school day during the school year. At the end of the year the child had covered, without special effort, all the work required in the first two grades of the public school. She entered the third grade the next year, and easily kept up with her classes. Since then she has graduated from Duke University with a good record.

Our State Department of Public Instruction should recall the experiment conducted in Richmond in 1928-1929, at the request of a Parent-Teachers' Association.

"A committee was appointed 'consisting of four physicians, two mothers, and one teacher, to investigate the relation of shorter hours to the health of children in the first three grades of school.' Two schools serving virtually the same class of people were used, each furnishing a few more than 250 pupils. In the test group the closing time was 12:30 for the first and second grades, 2:00 for the third grades. In the control group, the closing hours were 1:30 or 1:45 for the first grades, 2:00 for the second grades, and 2:45 for the third grades. The opening time was 9:45 for both groups.

"At the end of the year it was found that the average child in the test group had gained 5.12 pounds, in the control group 3.81. At the beginning of the experiment it was agreed that measles, on account of its highly contagious nature, would not be counted against either group. Exclusive of measles, there were 225 pupil days lost on account of illness in the test group, and 1,677 days in the control group—a 600 per cent greater loss of time in the long-hour group.

"From the standpoint of the school authorities, the experiment was altogether in favor of the short-hour group, which made 18.5 per cent more A's on deportment, had the highest per cent of promotions ever recorded, and scored well above the average of the other schools in the city on standard achievement tests. As for the parents, 88.13 per cent of

them answered the question, 'Do you think the shorter hours are of benefit to your child?' with an unqualified 'Yes.' "(3)

As a result of the experiment the shorter hours were instituted for the first three grades of all the Richmond schools.

A poll of the pediatricians in Winston-Salem revealed that every one was in favor of keeping the hours as they are now, and felt that to lengthen the day would be a step backward instead of forward. The State Department authorities explain that the children need the extra time in school in order to let them get lunch there instead of at home. The inference to be drawn from this —that the state, rather than the parents, is the natural guardian of the child—might be accepted without question in Russia, but not in North Carolina.

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* * *

THE RED CROSS ANNUAL APPEAL

The 1952 Red Cross fund appeal comes at a time of continuing world-wide crisis that demands a great voluntary effort on the part of everyone, since military strength alone cannot solve the problems created by this crisis.

Many of us take the millions of Red Cross workers and their humanitarian activities for granted—and few of us realize the many things they do in our name each day—tasks of mercy we would perform gladly if we were at hand or if we knew the need.

Each day volunteers in towns and cities throughout the country carry on a staggering program. Blood is collected and made available to the armed forces and to civilian hospitals; able-bodied and hospitalized servicemen and women are assisted in a thousand ways; disaster sufferers receive emergency care and shelter as well as long-term rehabilitation aid.

Through less dramatic programs of service the Red Cross trains nurse's aides, home nurses, and first aiders, all of whom provide a foundation for civil defense—self-help. The Red Cross gives children an opportunity to serve their community, nation, and world—thus preparing them for the responsibilities of citizenship. In the fields of health and safety the Red Cross stands ready to give instruction, training, and information. Internationally, it helps to make the facilities and advantages of America available to other countries and peoples in need.

The Red Cross has a far-reaching effect upon the life of every American, especially during these uncertain times. Let's do our part to keep the services of the Red Cross geared to meet the needs of the nation and all its citizens. Answer the call of the Red Cross today so that Red Cross can answer the call of Americans tomorrow.

* * *

FLUORIDATION OF WATER SUPPLY

A statement by Dr. Roy Norton, our State Health Officer, in favor of adding fluoride to Raleigh's public water supply was released for publication on February 21. The *New England Journal of Medicine* for February 28 carried an editorial on the same subject. This coincidence illustrates the widespread interest in the subject. It also shows that human nature in a New England Yankee and in a Southerner is pretty much the same, since it is necessary in both sections to overcome prejudice against what some misguided people consider as forcing medical treatment upon a community against the wishes of a few individuals.

Both Dr. Norton and Editor Joe Garland offer convincing arguments as to the value and the harmlessness of adding to the public water supply fluoride in the quantities not exceeding one part per million. The practice has the endorsement of the American Dental Association and the Council on Pharmacy and Chemistry of the American Medical Association. As Dr. Norton concludes:

"The North Carolina State Board of Health certainly would not advocate any measure unless it believed that measure beneficial, not to a few but to all the people. Whether some like it or not, the world is moving on and will continue to do so as long as the human mind is allowed to explore new fields and discover added benefits for health and happiness. The policy of fluoridation also is given the endorsement of the United States Public Health Service, which is responsible not to only four million people but to more than 150 million people.

"It is pointed out by the Public Health Service that for about a dime a year, per person, communities can add fluoride to their water supplies and bring their children the benefits of 40 to 65 per cent less tooth decay. Children under one year of age will receive practically full benefits of fluoride drinking water. Children who are older, when fluoride is added to the water, will receive substantial protection against tooth decay, but not so much as young-

er children. This protection, however, continues throughout life. The United States Public Health Service also points out that, by adding fluoride to community water supplies, dental bills can be materially decreased for both extractions and replacements. The cost of a single filling will pay for fluoride for one person for about 30 years."

* * *

DOROTHY THOMPSON ON BARBITURATES

The leading article by Miss Dorothy Thompson, in the *Ladies Home Journal* for March, is a sweeping condemnation of barbiturates[1]. Much of what Miss Thompson says is true; but it is calculated to do far more harm than good. Unquestionably the barbiturates are greatly abused, and they should be dispensed only on the prescription of doctors who understand the needs of the patients for whom they are intended.

The chief objection to such articles as Miss Thompson's is that they are read avidly by the very people who most need barbiturates. These patients then become so afraid of becoming addicts that it requires all a doctor's powers of persuasion to convince them that they will not become addicts from an occasional sleeping pill or capsule. One can hardly blame a patient for being frightened by such statements as "even ordinary doses can produce temporary mental disturbances, delirium and even hallucinations"; "A long period of use, with cumulative effects, produces symptoms difficult to distinguish from those of paresis, encephalitis, multiple sclerosis or acute psychosis (insanity)."[1]

Even if a doctor succeeds in getting such a patient to take the prescription for a hypnotic out of the office, the chances are that it will never be filled; or if filled, that it will not be taken; or if taken, that the fear engendered by such an article will more than outweigh the sedative effect of the drug. A writer in a recent issue of the *British Medical Journal* said that most patients with anxiety neuroses required at least twice the average dose of a hypnotic in order to overcome their prejudice against any sort of sedation. Great Britain must also have its lay writers on medical subjects.

In contrast to Miss Thompson's authoritative statements as to the danger of barbiturates, and also as to their uselessness, Dr. Walter Alvarez, in his recent classic work, *The Neuroses*, says:

"Many persons with insomnia need help from drugs. They could get to sleep without them, but they might have to wait until 2 a.m., and that would mean that they would be sleepy next day . . . Many laymen and even some physicians fear soporifics and think that they are habit forming, but in my experience, they are not. True habituation with euphoria or a running up of the dosage, or withdrawal symptoms have been reported, but I have not seen the syndrome. In forty-five years I have seen perhaps a dozen persons who were taking barbiturates to excess, but they had all had a psychopathic personality to begin with. Every one of them was able to stop the use of the drug instantly and without symptoms of withdrawal; their only complaint then was that without help from **something** they could not sleep."[2]

And Dr. Wallace Yater has recently said:

"Of all the drugs at our disposal perhaps the most valuable are phenobarbital and belladonna. The former has been very much maligned in recent years. It has been called a dangerous drug, and yet I venture to say that it is prescribed more than any other. It has been called habit-forming, but my own experience is that it is harder to get patients to continue taking it than to stop its use."[3]

Undoubtedly a patient's confidence in his doctor is one of the chief factors in his recovery. Anything that lessens that confidence does the patient a disservice. For that reason, professional writers should be very careful of the subjects they choose and the language they use in writing articles on medical matters. The patients who most need to accept medical advice are often the ones who are most influenced by what they read in popular magazines.

Such patients may, to some extent, be desensitized to such articles by telling them the story of Dr. Oliver Wendell Holmes, who, on finding one of his hypochondriacal patients poring over a medical book in the Boston Public Library, tapped him on the shoulder and whispered, "Better look out, old man! Some day you'll die of a misprint."

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* * *

Committees and Organizations

Public Relations Committee

THE DOCTOR AND REHABILITATION

The North Carolina Department of Vocational Rehabilitation and the physician can be of tremendous help to each other. To the doctor, the agency is a means of helping many of his patients who have physical or mental handicaps and who are unable to pay for essential medical care. To the agency, the doctor gives valuable advice, diagnostic aid, and restorative measures through treatment or corrective surgery.

The Rehabilitation Department accepts clients under the following circumstances:

1. The individual must have a permanent or static disability which constitutes an employment handicap. The department does not accept acute cases.

2. He must be unable to pay part or all of the bill. Rehabilitation supplies the difference.

3. The prognosis for the patient returning to self-sustaining work must be favorable.

4. The condition must be such that it can be cured or substantially alleviated by a short period of hospitalization or medical care.

5. Usually the department cannot accept cancer cases, because the prognosis is poor. Tuberculosis can only be accepted for service other than treatment. Treatment of tuberculosis would be of a long drawn-out nature. There are other cases in which the prognosis at best is poor.

Rehabilitation accepts cases, not to sponsor treatment as such, but to enable the individual to return to gainful employment.

Rehabilitation, in addition to medical treatment and surgery, is able to provide training tuition, training supplies, occupational tools and equipment, prosthesis, or whatever the particular individual needs, in each particular case, to return to gainful employment.

Without the doctor's evaluation, some hidden condition such as a bad heart might exist and cause attempts at rehabilitation to go for naught. Again, corrective surgery may enable a person to do work he is physically unable to do.

The physician and Rehabilitation may be considered a team, each supplying that phase of service needed to restore to employment or make employable the physically handicapped person. Approximately one fifth of all persons on Rehabilitation rolls are referred by one or another category of medical personnel. Rehabilitation in turn, refers many patients to the physician who otherwise would never have secured needed medical attention.

Many times a physician ponders a patient's problem of medical restoration. Rehabilitation is one outlet for many. The referrals and evaluations of physicians are welcomed.

After the doctor has completed the treatment phase the rehabilitation counselor is faced with the problem of getting the patient into employment. Here the doctor is of immense importance in the picture. His advice as to work limitations and capacities plays a vital part, on which might well hinge the future vocational adjustment of the patient. The counselor can test the aptitudes, provide training, tools, counsel, guidance and placement; but, unless he knows the capacities and limitations of the patient, he is in a difficult procedure. What can the patient do? What can't he do? What must he guard against? What is the prognosis, both for life and for work expectancy? These are the problems the physician must evaluate in guiding the patient and the rehabilitation counselor.

ROBERT B. HAWKINS
Senior Rehabilitation Supervisor

BULLETIN BOARD

PRELIMINARY PROGRAM
of the
NINETY-EIGHTH ANNUAL SESSION
The Medical Society
of the
State of North Carolina
May 5, 6, and 7, 1952
PINEHURST, NORTH CAROLINA
Headquarters—Hotel Carolina

RESUME OF PROGRAM

SUNDAY, MAY 4, 1952

11:00 A.M.—Executive Council Meeting (Small Card Room)
2:00 P.M.—Medical Motion Picture (Large Card Room)
8:00 P.M.—Memorial Service
Sermon: "Witnessing Our Own Immortality"
Dr. I. G. Greer, Executive Vice President of the Business Foundation of North Carolina, Chapel Hill, N. C. (Ball Room)
Music: Sandhills Madrigal Society—Choral Selections

MONDAY, MAY 5, 1952

9:00 A.M.—Registration Booth opens (Front Lobby)
9:00 A.M.—Technical Exhibits open (West Porches)
9:30 A.M.—Medical Motion Picture (Large Card Room)
1:00 P.M.—Scientific Exhibits open (East Porches)
2:00 P.M.—House of Delegates of Medical Society (Ball Room)
5:30 P.M.—Intermission, House of Delegates of Medical Society
5:30 P.M.—Social Hour, Medical College of Virginia Alumni Association (Pine Room)
6:00 P.M.—Medical College of Virginia Alumni Dinner (Crystal Room)
6:00 P.M.—Scientific and Technical Exhibits Close
8:00 P.M.—House of Delegates Reconvenes (Ball Room)
8:00 P.M.—Medical Auxiliary Executive Board (Dutch Room)
8:30 P.M.—Medical Auxiliary Bingo Party (Large Card Room)

TUESDAY, MAY 6, 1952

7:00 A.M.—Medical Officers' Breakfast (Crystal Room)
8:00 A.M.—Registration Booth opens (Front Lobby)
8:45 A.M.—Exhibits open (West Porches—East Porches)
9:00 A.M.—First General Session of Medical Society (Ball Room)
9:00 A.M.—Medical Auxiliary, House of Delegates Meeting (Pine Room)
11:30 A.M.—Medical Auxiliary Annual Meeting (Pine Room)
12:10 P.M.—Presentation High School Essay Contest Winner (Amos N. Johnson, M.D., Chairman)—Ball Room
1:00 P.M.—Medical Auxiliary Luncheon (Pinehurst Country Club)
1:00 P.M.—Medical Alumni Luncheons (Schedule and places to be announced in official program.)
2:30 P.M.—Scientific Section Meetings, Medical Society:
Section on Practice of Medicine and Surgery (Large Card Room)
Section on Surgery (Ball Room)
Section on Neurology and Psychiatry (Theatre)
Section on Radiology (Pine Room)
Section on Pathology (Dutch Room)
7:00 P.M.—President's Dinner (Main Dining Room)
10:00 P.M.—Entertainment—Floor Show (Ball Room)
11:00 P.M.—President's Ball (Ball Room)

WEDNESDAY, MAY 7, 1952

8:00 A.M.—Registration Booth opens (Front Lobby)
8:45 A.M.—Exhibits open (West Porches—East Porches)
9:00 A.M.—Medical Auxiliary Officers' Breakfast (Stag Room)
9:00 A.M.—Second General Session, Medical Society (Ball Room)
10:00 A.M.—Bridge and Canasta Party Medical Auxiliary (Large Card Room)
10:50 A.M.—Nominations and Elections
12:00 Noon—Recess for Conjoint Session (Ball Room)
12:25 P.M.—Reconvene General Session—Award of Exhibit Attendance Prizes and Golf Prizes (Ball Room)
1:00 P.M. Medical Alumni Luncheons (Schedule and places to be announced in official program.)
2:30 P.M.—Second Meeting, House of Delegates Medical Society (Small Card Room)
2:30 P.M.—Scientific Section Meetings, Medical Society:
Section on Practice of Medicine (Ball Room)
Section on Opthalmology and Otolaryngology (Large Card Room)
Section on Pediatrics (Theatre)
Section on Gynecology and Obstetrics (Pine Room)
Section on Public Health and Education (The Village Chapel—Episcopal)
5:00 P.M.—Third General Session (Ball Room)
Adjournment *Sine Die*

PROGRAM OF THE MEDICAL SOCIETY

OFFICERS' BREAKFAST
TUESDAY, MAY 6, 1952
(Crystal Room)

7:00 A.M.—(Officers will assemble in Crystal Room)
7:30 A.M.—Breakfast for Officers (Crystal Room)
Dr. Fred C. Hubbard, Presiding
8:00 A.M.—Address (subject to be announced)
Mr. Leo Brown, Director, Department of Public Relations, American Medical Association, Chicago
8:30 A.M.—Announcements
Adjournment

FIRST GENERAL SESSION
TUESDAY, MAY 6
(Ball Room)

9:00 A.M.—Call to Order, Millard D. Hill, M.D., Chairman, Committee on Arrangements
Invocation:
Announcements
Presentation of President Frederic C. Hubbard, M.D.
9:10 A.M.—Report of Committee on Scientific Awards:
Rowland T. Bellows, M. D., Chairman, Charlotte
William S. Dosher, M.D., Wilmington
Isaac H. Manning, Jr., M.D., Durham
Ernest Furgurson, M.D., Plymouth
9:20 A.M.—From Section on General Practice of Medicine and Surgery — Wiley S. Cozart, M.D., Fuquay Springs, Chairman
"Caution—Curves Ahead"
Mr. Mac F. Cahal, Executive Secretary, National American Academy of General Practice, Kansas City, Kansas
9:40 A.M.—From Section on Surgery—Donald B. Koonce, M.D., Chairman, Wilmington
"The Use of Gastric Analysis in the Diagnosis of Surgical Disease"
Nathan Womack, M.D., Chapel Hill
Discussant: Deryl Hart, M.D., Durham
10:00 A.M.—Address: "A New Approach to the Care of Alcoholics at the State Level"—Ebbe C. Hoff, M.D., Professor of Neurological Science, Medical College of Virginia; Medical Director of the Division of Alcohol Studies and Rehabilitation of the State Department of Health, Richmond
10:30 A.M.—Address:
John W. Cline, M.D., President, American Medical Association, San Francisco, California
11:00 A.M.—From Section on Neurology and Psychiatry—Guy L. Odom, M.D., Chairman, Durham
Title to be Announced
George C. Ham, M.D., Professor of Psychiatry, University of North Carolina, Chapel Hill
11:20 A.M.—From Section on Radiology—George J. Baylin, M.D., Chairman, Durham
"Abnormalities of Canalization of the Gastro-Intestinal Tract"
Edward B. D. Neuhauser, M.D., Chief Radiologist at the Children's Medical Center, Boston, Massachusetts
11:40 A.M.—From Section on Pathology — Thomas B. Wilson, M.D., Chairman, Raleigh
"Role of the Bronchial Artery in Pulmonary Disease"
C. Bruce Taylor, M.D., Chapel Hill

SECTION ON PRACTICE OF MEDICINE AND SURGERY

(Large Card Room)

Tuesday, May 6, 2:30 P.M.

Wiley S. Cozart, M.D., Chairman, Fuquay Springs

"Thoracic Surgical Problems in Infancy and Childhood"
W. C. Sealy, M.D., Duke University, Durham

"Electrocardiography in General Practice"
D. N. Stewart, M.D., Hickory

"Use of Intravenous Procaine Hydrochloride, Medical and Surgical Conditions"
A. G. Crumpler, M.D., Fuquay Springs

"Management of Gout
Henry L. Valk, M.D., Bowman Gray, Winston-Salem

"Trichlorethyene (Triolene) Analgesia for Obstetrics and Minor Surgery in a General Practice"
Gordon Smith, M.D., Snow Hill

"Comparative Biological Effects of the Vitamin Inositol with Other Like Vitamins"
R. F. Mobbs, M.D., Aberdeen

"Caution—Curves Ahead"
Mr. Mac F. Cahal, Executive Secretary, National American Academy of General Practice, Kansas City, Missouri
(Before First General Session)

SECTION ON SURGERY

(Ball Room)

Tuesday, May 6, 2:30 P.M.

Donald B. Koonce, M.D., Chairman, Wilmington

"An Evaluation of the Present Methods of Treatment of Prostatic Obstructions"
William Coppridge, M.D., Durham; Louis C. Roberts, M.D., Durham; Jack Hughes, M.D., Durham
Discussant: John Rhodes, M.D., Raleigh

"Surgery in the Older Person"
Howard Bradshaw, M.D., Winston-Salem
Discussant: Wingate M. Johnson, M.D., Winston-Salem

"A Technique of Saphenous Vein Stripping" (Moving Picture)
Alex Webb, M.D., Raleigh
Discussant: Max Schiebel, M.D., Durham

"Management of Symptomless Intrathoracic Lesions"
Paul Sanger, M.D., Charlotte
Discussant: W. C. Sealy, M.D., Durham

"Anesthesia and Supportive Therapy for Surgery in Infants and Children"
Felda Hightower, M.D., Winston-Salem
Discussant: Leonard Nanzetta, M.D., Winston-Salem

"The General Principles of Treating Fractures in Children"
Lenox Baker, M.D., Durham, and R. W. Coonrad, M.D., Durham
Discussant: Malory Pittman, M.D., Wilson

"The Use of Gastric Analysis in the Diagnosis of Surgical Disease"
Nathan Womack, M.D., Chapel Hill
Discussant: Deryl Hart, M.D., Durham
(Before First General Session)

SECTION ON NEUROLOGY AND PSYCHIATRY

(Theatre)

Tuesday, May 6, 2:30 P.M.

Guy L. Odom, M.D., Chairman, Durham

"Diagnostic Problems of Slow Growing Intracranial Tumors"
Richard H. Ames, M.D., Greensboro
Discussant: Joseph B. Stevens, M.D., Greensboro

"Psychiatric and Psychological Evaluation of Sixty First Offenders"
William P. Wilson, M.D., Duke University School of Medicine, Durham

"Residual Effects of Rocky Mountain Spotted Fever on the Central Nervous System"
George T. Harrell, M.D., and Richard L. Masland, M.D., Bowman Gray School of Medicine, Winston-Salem

"Survey of Ruptured Intervertebral Discs in the Cervical Region"
Courtland H. Davis, Jr., M.D., Guy L. Odom, M.D., and Barnes Woodhall, M.D., Duke University School of Medicine, Durham
Discussant:

"Severe Choreic States in Adults as Manifestations of Depressive Reactions"
Colonel William E. Wilkinson, M.D., U. S. Army, Duke University School of Medicine, Durham

"The Care of the Traumatic Paraplegic"
Eben Alexander, Jr., M.D., Bowman Gray School of Medicine, Winston-Salem

Title to be Announced
George C. Ham, M.D., Professor of Psychiatry, University of North Carolina, Chapel Hill
(Before First General Session)

SECTION ON RADIOLOGY

(Pine Room)

Tuesday, May 6, 2:30 P.M.

George J. Baylin, M.D., Chairman, Durham

"The Management of Cystic Disease of the Lungs"
Will C. Sealy, M.D., Associate Professor of Surgery in Charge of Thoracic Surgery, Duke Hospital, Durham

"Roentgen Findings in Congenital Deformities of the Hips, Joints and Lower Extremities"
Leonard Goldner, M.D., Assistant Professor of Orthopedic Service, Duke Hospital, Durham

"The Effects of the Atomic Blast at Hiroshima and Nagasaki"
W. C. Davison, M.D., Dean of Medical School and Professor of Pediatrics, Duke University

Intermission

"The Roentgen Diagnosis of Congenital Malformations of the Heart"
Edward B. D. Neuhauser, M.D., Chief Radiologist at The Children's Medical Center, Boston, Massachusetts

"Abnormalities of Canalization of the Gastro-Intestinal Tract"
Edward B. D. Neuhauser, M.D., Chief Radiologist at The Children's Medical Center, Boston, Massachusetts
(Before First General Session)

SECTION ON PATHOLOGY

(Dutch Room)

Tuesday, May 6, 2:30 P.M.

Thomas B. Wilson, M.D., Chairman, Raleigh

"A Classification of Renal Disease"
Paul Kimmelstiel, M.D., Charlotte

"Necrotizing Glomerulitis"
Thomas N. Lide, M.D., Winston-Salem

"Nephrotic Syndrome with Pyelonephritis"
Robert W. Prichard, M.D., Winston-Salem

"Hyperparathyroidism and Renal Dysfunction"
George J. Race, M.D., Durham

"Lower Nephron Nephrosis; an Unusual Case"
Bernard F. Fetter, M.D., Durham

"Role of the Bronchial Artery in Pulmonary Disease"
C. Bruce Taylor, M.D., Chapel Hill
(Before First General Session)

PRESIDENT'S DINNER

(Main Dining Room)
Tuesday, May 6, 1952

7:00 P.M.—Banquet
Toastmaster—W. Reece Berryhill, M.D., Chapel Hill
Invocation:

7:40 P.M.—Presentation of Guests

7:50 P.M.—Address:
President Fred C. Hubbard, M.D., North Wilkesboro

8:20 P.M.—Presentation of President's Jewel
James H. McNeill, M.D., North Wilkesboro

8:30 P.M.—Address: (Title to be designated)
John W. Cline, M.D., President, American Medical Association, San Francisco, California

9:10 P.M.—Adjournment

10:00 P.M.—Floor Show Entertainment
(Ball Room)

11:15 P.M.
to
2:00 A.M.—President's Ball

SECOND GENERAL SESSION

(Ball Room)
WEDNESDAY, MAY 7, 1952

Arthur L. Daughtridge, M. D.
Second Vice President, Presiding

9:00 A.M.—From Section on Practice of Medicine
George T. Harrell, M.D., Chairman
"The Effect of Cortisone on Infections"
Samuel P. Martin, M.D., Department of Medicine, Duke University School of Medicine, Durham

9:20 A.M.—From Section on Ophthalmology and Otolaryngology
Ralph A. Arnold, M.D., Chairman
"Vertigo"
Beverly Armstrong, M.D., Charlotte

9:40 A.M.—From Section on Pediatrics
William L. Venning, Jr., M.D., Chairman
"Cancer in Childhood"
Wilburt C. Davison, M.D., Dean, Duke University School of Medicine, Durham

10:00 A.M.—From Section on Gynecology and Obstetrics
Adam T. Thorpe, M.D., Chairman
"Transfer of Anesthetic and Analgesic Agents Across the Placental Barrier"
Charles E. Flowers, Jr., M.D., State University of New York, Brooklyn, New York

10:20 A.M.—From Section on Public Health and Education
O. David Garvin, M.D., Chairman
"Chronic Illness and the Aging Population"
William L. Fleming, M.D., Professor of Preventive Medicine, U.N.C. School of Medicine, Chapel Hill

10:40 A.M.—Election of members to expiring terms of boards

11:00 A.M.—Address: "The Relations of Doctors and the Farm Group"
Mrs. Haven Smith, Chappel, Nebraska

11:20 A.M.—(To be Announced)

11:50 A.M.—Recess of General Session

CONJOINT SESSION

Wednesday, May 7, 1952—12:00 o'clock Noon

G. Grady Dixon, President of the North Carolina State Board of Health, will preside over this meeting of the Medical Society of the State of North Carolina and the State Board of Health.

12:25 P.M.—Reconvening of Second General Session
Award of Golf Prizes and Exhibit Prizes

12:40 P.M.—Adjournment

SECTION ON PRACTICE OF MEDICINE

(Ball Room)
Wednesday, May 7, 2:30 P.M.

George T. Harrell, M.D., Chairman,
Winston-Salem

"Some Problems in the Clinical Use of Resins"
Woodrow Batten, M.D., Smithfield

"Evaluation of Renal Function"
Charles H. Burnett, M.D., Department of Medicine, School of Medicine, University of North Carolina, Chapel Hill

"Diagnostic and Therapeutic Use of Radioiodine"
Ernest H. Yount, Jr., M.D., and Robert Andrews, M.D., Departments of Internal Medicine and Radiology, Bowman Gray School of Medicine, Winston-Salem

"Subarachnoid Hemorrhage: Etiology and Mortality"
Guy L. Odom, M.D., Byron M. Bloor, M.D., James B. Golden, M.D., and Barnes Woodhall, M.D., Department of Neurosurgery, Duke University School of Medicine, Durham

"Etiology of Urticaria"
M. E. McRae, M.D., Greensboro

"The Effect of Cortisone on Infections"
Samuel P. Martin, M.D., Department of Medicine, Duke University School of Medicine, Durham
(Before Second General Session)

SECTION ON OPHTHALMOLOGY AND OTOLARYNGOLOGY

(Large Card Room)
Wednesday, May 7, 2:30 P.M.

Ralph Arnold, M.D., Chairman, Durham

"Corneal Transplantations"
L. Byerly Holt, M.D., Winston-Salem

"Use of Cortisone in the Eye"
Clinton Chandler, M.D., McPherson Hospital, Durham

"Nystagmus"
Paul Abernathy, M.D., Burlington

"Use of Chloromycetin in Ear, Nose and Throat"
James Harrill, M.D., Winston-Salem, John Ausband, M.D., Winston-Salem

"Treatment of Septal Abscess"
Wardell Mills, M.D., Greensboro

"Vertigo"
Beverly Armstrong, M.D., Charlotte
(Before Second General Session)

SECTION ON PEDIATRICS

(Theatre)
Wednesday, May 7, 2:30 P.M.

William L. Venning, Jr., M.D., Chairman,
Charlotte

"Humidification in Pediatrics"
Samuel F. Ravenel, M.D., Greensboro

"Harelip and Cleft Palate"
W. T. Berkeley, M.D., Charlotte

"Sins of Commission"
Robert T. Lawson, M.D., and J. B. Reinhart, M.D., Winston-Salem

"Two Case Reports — Aplastic Anemia — Due to Chloromycetin?"
John L. Cochran, Jr., M.D.

"Histoplasmosis, Case Report"
Robert J. Murphy, M.D., Raleigh, and William H. Davis, Jr., Elizabeth City

"Cancer in Childhood"
Wilburt C. Davison, M.D., Dean, Duke University Medical School, Durham
(Before Second General Session)

SECTION ON GYNECOLOGY AND OBSTETRICS
(Pine Room)
Wednesday, May 7, 2:30 P.M.

Adam T. Thorp, M.D., Chairman, Rocky Mount

"Evaluation of Methods of Pain Relief During Labor and Delivery with Reference to Mother and Child"
C. R. Stephen, M.D., Professor of Anesthesiology, Duke University, Durham
Discussants: C. E. Flowers, M.D., and R. N. Creadick, M.D.

"The Diagnosis and Management of Cervical Lesions" (with lantern slides)
Carlton N. Adams, M.D., Winston-Salem, and Donald Whitener, M.D., Winston-Salem

"Curability of Carcinoma of the Uterine Cervix"
J. Robert Andrews, M.D., Professor of Radiology, Bowman Gray School of Medicine, Winston-Salem

Tentative Title "Experiences with the Papanicolau Smear"
Thomas W. Huey, Jr., M.D., Charlotte

"Transfer of Anesthetic and Analgesic Agents Across the Placental Barrier"
Charles E. Flowers, Jr., M.D., State University of New York, Brooklyn, New York
(Before Second General Session)

SECTION ON PUBLIC HEALTH AND EDUCATION
Village Chapel—Episcopal
Wednesday, May 7, 2:30 P.M.

O. David Garvin, M.D., Chairman, Chapel Hill

"Growth of School Children as an Index of the Nutritional Status of the Community"
A. Hughes Bryan, M.D., Professor of Public Health Nutrition, University of North Carolina, Chapel Hill
Discussant:

"Chronic Illness and the Aging Population"
William L. Fleming, M.D., Professor of Preventive Medicine, U.N.C. School of Medicine, Chapel Hill
(Before Second General Session)

THIRD GENERAL SESSION
(Ball Room)

Wednesday, May 7, 1952

5:00 P.M.—Report of the House of Delegates
5:15 P.M.—Unfinished Business
5:20 P.M.—New Business
5:30 P.M.—Installation of President, President-Elect, and Vice-Presidents
5:40 P.M.—Remarks by President and President-Elect
5:50 P.M.—Adjournment **sine die**

NEWS NOTES FROM THE UNIVERSITY OF NORTH CAROLINA SCHOOL OF MEDICINE

Postgraduate medical courses sponsored by the University School of Medicine and the Extension Division have been arranged at Gastonia, with the Gaston County Medical Society and adjoining county societies as co-sponsors, and at Salisbury, with the Rowan-Davie Counties Society as co-sponsor. The programs are as follows:

GASTONIA

March 19—
4:00 p.m. Painless Hemorrhage of Late Pregnancy
7:30 p.m. Differentiation of Hypertension in Pregnancy
Dr. John S. Fish, Emory University School of Medicine

March 26—
4:00 p.m. Liver Disease: Diagnosis
7:30 p.m. Liver Disease: Treatment
Dr. Franz J. Ingelfinger, Boston University Medical School

April 2—
4:00 p.m. The Relation of Life Stress to Organic Disease
7:30 p.m. A Further Discussion of The Relation of Life Stress to Organic Disease
Dr. Stewart G. Wolf, University of Oklahoma School of Medicine

April 9—
4:00 p.m. Diagnosis of Peripheral Vascular Disease
7:30 p.m. Treatment of Peripheral Vascular Disease
Dr. Hugh Montgomery, University of Pennsylvania School of Medicine

April 16—
4:00 p.m. Recent Advances in Pediatrics
7:30 p.m. Rheumatic Fever in Children
Dr. Robert D. Mercer, Cleveland Clinic, Cleveland

April 23—
4:00 p.m. Anesthesia; exact topic to be announced.
7:30 p.m. Anesthesia; exact topic to be announced.
Dr. Edward B. Tuohy, Georgetown University School of Medicine

SALISBURY

March 20—
4:00 p.m. Painless Hemorrhage of Late Pregnancy
7:30 p.m. Differentiation of Hypertension in Pregnancy
Dr. John S. Fish, Emory University School of Medicine

March 27—
4:00 p.m. Liver Disease: Diagnosis
7:30 p.m. Liver Disease: Treatment
Dr. Franz J. Ingelfinger, Boston University Medical School

April 3—
4:00 p.m. The Relation of Life Stress to Organic Disease
7:30 p.m. A Further Discussion of The Relation of Life Stress to Organic Disease
Dr. Stewart G. Wolf, University of Oklahoma School of Medicine

April 10—
4:00 p.m. Diagnosis of Peripheral Vascular Disease
7:30 p.m. Treatment of Peripheral Vascular Disease
Dr. Hugh Montgomery, University of Pennsylvania School of Medicine

April 17—
4:00 p.m. Recent Advances in Pediatrics
7:30 p.m. Rheumatic Fever in Children
Dr. Robert D. Mercer, Cleveland Clinic, Cleveland

April 24—
4:00 p.m. Anesthesia;
exact topic to be announced.
7:30 p.m. Anesthesia;
exact topic to be announced.
Dr. Edward B. Tuohy, Georgetown University School of Medicine

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Dr. N. A. Womack attended a joint meeting of the Society of Clinical Surgery, the Society of University Surgeons, and the Halsted Club in Baltimore on February 7 and 8.

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Dr. Charles H. Burnett spoke to the Randolph County Medical Society at its February meeting on "Mechanisms and Management of Edema."

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New appointments to the staff include:

Dr. W. P. Richardson, currently research professor of public health administration and head of the Department of Field Training in the School of Public Health of the University, as professor of preventive medicine and assistant dean in charge of continuation education. Dr. Richardson received his medical training at the Medical College of Virginia and his public health training at Johns Hopkins University. Since returning to North Carolina he has worked with several county health departments, the State Board of Health, and the School of Public Health at the University.

Dr. David A. Young, superintendent of the North Carolina Hospitals Board of Control, as clinical professor of psychiatry. Dr. Young attended Harvard Medical School and before returning to North Carolina in 1945 was a member of the faculty of the University of Utah.

Dr. Ernest Craige, a graduate of Harvard Medical School and at the present assistant in medicine at the Massachusetts General Hospital and the Harvard Medical School as assistant professor of medicine.

Dr. Isaac M. Taylor as assistant professor of medicine. Dr. Taylor also received his training at Harvard and at the Massachusetts General Hospital.

Dr. Jeffress G. Palmer as assistant professor of medicine. Dr. Palmer attended Emory University School of Medicine, had training at the North Carolina Baptist Hospital, and is at the present time a fellow in medicine at the University of Utah.

Dr. Thomas B. Barnett as instructor in medicine. Dr. Barnett is a graduate of the University of Rochester School of Medicine, where he now holds a position in the Department of Medicine.

Dr. Richard M. Peters as assistant professor of surgery in thoracic surgery. Dr. Peters received his training at Yale University and Washington University; since July, 1950, he has been on the staff at the latter institution.

Dr. Colin G. Thomas, Jr., a graduate of the University of Chicago Medical School, as assistant professor of surgery in general surgery. He comes to the University from the staff of the State University of Iowa College of Medicine.

Dr. John B. Hill and Dr. Gabriel F. Tucker, Jr., as assistant professors of pharmacology. Dr. Hill had his undergraduate training at the University of Wisconsin and his Ph.D. degree from Columbia University; before joining the staff at Columbia he taught at the University of Wisconsin. Dr. Gabriel received his M.D. degree at Johns Hopkins University and is now serving an internship at the Graduate Hospital of the University of Pennsylvania.

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The first annual Medical Alumni Day was held in Chapel Hill on March 5; 250 alumni were present. Of the 28 living alumni of the old Medical School of the University that was operated in Raleigh from 1902 to 1910, the following were present: Drs. Z. M. Caveness of Raleigh, A. G. Woodard of Goldsboro, J. A. Ward of Hertford, A. E. Riggsbee of Durham, A. F. Nichols of Roxboro, J. M. Wilcox of Carthage, G. W. Gentry of Roxboro, and John A. Ferrell of Raleigh, and Dean Hubert Royster of Raleigh. Dr. William Coppridge, president of the Medical Alumni Association, presided at the meeting. Dr. W. T. Sanger, president of the Medical College of Virginia, Dr. Samuel H. Proger, of the New England Medical Center and professor of medicine at Tufts College Medical School, Dr. Charles M. Caravati, associate professor of clinical medicine at the Medical College of Virginia, Dr. Kinloch Nelson, professor of clinical medicine at the Medical College of Virginia, and Dr. John A. Ferrell, executive secretary of the North Carolina Medical Care Commission, participated in a roundtable discussion of the educational service functions of the Medical School to the State.

Officers of the Medical Alumni Association elected for the coming year were: president, Dr. Roy B. McKnight of Charlotte; vice president, Dr. Milton S. Clark of Goldsboro; secretary-treasurer, Dr. Thomas G. Thurston of Salisbury. Dr. J. B. Caldwell of Gastonia and Dr. Russell O. Lyday of Greensboro were named to the Alumni Council.

News Notes from the Bowman Gray School of Medicine of Wake Forest College

Postgraduate Courses

The first postgraduate course in psychiatry and neurology to be offered by the Bowman Gray School of Medicine of Wake Forest College will be available to 30 general practitioners and public health officers on March 18 and 19, 1952. The course will be under the direction of Dr. Lloyd J. Thompson, professor and director of the Department of Psychiatry and Neurology. Other participants in the teaching of the course will be: Dr. Richard L. Masland, associate professor of psychiatry and neurology; Dr. Paul Haun, assistant professor of psychiatry and clinical director of Graylyn; Dr. Angus C. Randolph, assistant professor of clinical psychiatry; Dr. John B. Reinhart, instructor in pediatrics and assistant in clinical psychiatry; Dr. Richard C. Proctor, instructor in psychiatry and neurology, and assistant director of Graylyn; Dr. Eben Alexander, Jr., assistant professor of neurosurgery; Dr. Robert L. McMillan, professor of clinical internal medicine; Dr. Frank R. Lock, professor and director of obstetrics and gynecology; Dr. David Cayer, associate professor of internal medicine; Miss Mary Sumner, associate in psychiatric social work; and Mr. Joseph Grassi, assistant professor of clinical psychology. Plans have been made for tours of the facilities at Graylyn, the rehabilitation center, as well as neurologic, psychiatric, and neurosurgical clinics, discussions of alcoholism, psychosomatic aspects of cardiovascular disorders, obstetrics and gynecology, and gastrointestinal disorders, in addition to demonstration of techniques of treatment.

The Bowman Gray School of Medicine will sponsor a postgraduate course in cardiovascular diseases on March 25, 26, and 27, under the direction of Dr. Robert L. McMillan, professor of internal medicine. The course will be offered to 35 general practitioners of small North Carolina communities, and the teaching will be a correlative effort on the part of the Departments of Internal Medicine, Radiology,

Microbiology, Surgery, Physiology and Pharmacology, Pediatrics, Obstetrics and Gynecology, and Psychiatry and Neurology. Included in the program are clinics, round table discussions, and lectures.

* * *

The Medical Alumni of Wake Forest College will meet at the Bowman Gray School of Medicine on April 17. During the morning hours, members of the faculty will be available on each of the hospital wards for rounds or conferences. During the afternoon a series of clinics will be presented by the faculty of the Departments of Surgery, Obstetrics and Gynecology, Internal Medicine, Pediatrics, Psychiatry and Neurology, and Neurosurgery. There will be a reception and banquet at the Old Town Club in Winston-Salem at six o'clock for the alumni and their wives.

* * *

Dr. Frank Lock, professor and director of obstetrics and gynecology, has recently been appointed on a committee to make a study and recommendations concerning possible revisions in the National Board examinations. Serving with Dr. Lock on the committee, which met in Princeton on February 29, are: Dr. William F. Mengert, chairman of the Department of Obstetrics and Gynecology, Southwestern Medical College; Dr. John I. Brewer, professor of obstetrics and gynecology, Northwestern University School of Medicine; Dr. Thaddeus L. Montgomery, professor of obstetrics and gynecology, Jefferson Medical College; and Dr. William E. Studdiford, Jr., professor of obstetrics and gynecology, New York University School of Medicine.

North Carolina State Board of Health

"More than 96 per cent of the babies born in North Carolina now receive a birth certificate, according to the preliminary findings of a nationwide survey of birth registration," Dr. J. W. R. Norton, State Health Officer, has just announced. Dr. Norton stated that this registration test, recently conducted by the United States Public Health Service and the United States Bureau of the Census, with the North Carolina State Board of Health cooperating, revealed that North Carolina had a registration completeness of 96.1 per cent in 1950 as compared with 86.1 per cent in 1940. There are still an average of about four children out of every hundred born whose births are not properly filed by the attendant, to provide them with such identification later in life.

"Copies of such certificates are now needed for school enrollment, entrance into the Armed Services, passports for travel to foreign countries, identification, employment, inheritance, and many other purposes," Dr. Norton said. "Unless such births have been registered early, considerable delay is often encountered when certificates are needed; and the longer the delay, the more that are not filed."

North Carolina Tuberculosis Association

With 104 units reporting as of January 15, 1952, the total 1951 Seal sale is $416,394.13. Of the 104 units, 99 had comparable reports. These 99 units show an increase of $23,314.35, or 6 per cent over the same period last year.

Beaufort County, with a $6,868.42 over January 1951, shows the largest increase. Mecklenburg is next with an increase of $6,728.07, and then Cumberland, who topped the 1951 report by $5,000.

* * *

Twenty-six persons were enrolled at the NTA Institute held in Southern Pines on February 4-15. Those appearing on the program from North Carolina were: Dr. William M. Peck, North Carolina Sanatorium; Dr. H. Stuart Willis, superintendent of North Carolina Sanatoriums; and Dr. Lucy Morgan, professor of health education, University of North Carolina.

* * *

Twenty-five grants to aid medical research projects in tuberculosis and 11 research and teaching fellowships have been approved by the Board of Directors of the National Tuberculosis Association for the fiscal year beginning April, according to an announcement by Dr. Esmond R. Long, Director of Medical Research for the NTA.

Three grants were made in North Carolina: two to Duke University and one to the North Carolina State Sanatorium.

* * *

The Trudeau School of Tuberculosis will present its thirty-eighth annual session, beginning Monday, April 28, 1952, and continuing for four weeks. The subject matter will cover all aspects of pulmonary tuberculosis and also certain phases of other chronic chest diseases, including those of occupational origin.

A number of reservations have been requested for the 1952 session and inasmuch as registration is limited it is suggested that those who plan to attend make early application.

Address: Secretary, Trudeau School, Saranac Lake, New York.

North Carolina Society for Crippled Children and Adults

East Carolina College at Greenville, North Carolina, will again offer courses for teachers dealing with slow learners, and children with speech defects and hearing losses. Two clinics will be held for handicapped children.

Western Carolina Teachers College will have well known specialists for the courses for teachers interested in slow learning, emotional disturbances, speech defects, hearing losses, and orthopedically handicapped children. Clinical assistants will conduct the classes for the children. Dean W. E. Bird announces that a parent-child program will be tried this summer. The parent must register in courses related to her child's difficulty.

The University of North Carolina School of Education will offer three types of services for teachers interested in special education. Capable leadership will be provided for teachers wishing to help slow learners, those with speech handicaps, and those with reading difficulties. Limited laboratory and clinical experiences will be available. All work is on a graduate level.

North Carolina College in Durham is planning its program for special education teachers.

For information write to the Summer School Director—of the college of your choice.

Eighth District Medical Society

The Eighth District Medical Society will hold a meeting on April 10 at the Jefferson Club near Guilford College.

Edgecombe-Nash Medical Society

The regular monthly meeting of the Edgecombe-Nash Medical Society was held in Rocky Mount on February 12 in conjunction with the regular meeting of the Fourth District Medical Society. Speaker of the evening was Dr. Ivan Brown, director of the blood bank, Duke Hospital, and associate director of the American Red Cross blood program.

Forsyth County Medical Society

Dr. Byrd S. Leavell, associate professor of medicine at the University of Virginia, spoke on "Some Problems Associated with Splenomegaly" at the dinner meeting of the Forsyth County Medical Society held on February 12, in Winston-Salem.

Carteret County Medical Society

The Morehead City Hospital entertained the Carteret County Medical Society at its regular monthly meeting Monday night, February 11. The scientific paper was presented by Dr. George W. Johnson, surgeon, of Wilmington. His subject was "Surgical Female Disorders."

The secretary of the society announced that the Camp Lejeune medical staff had invited the Carteret County Medical Society to attend the Camp Lejeune regular monthly medical and surgical seminar.

The president, Dr. Milton B. Morey, presided.

N. THOMAS ENNETT, M.D.
Corresponding Secretary

Duke University Medical Alumni Luncheon

The Duke Medical Alumni luncheon during the meeting of the Medical Society of the State of North Carolina will be held Tuesday, May 6, at 1:00 p.m., at the Mid-Pines Club. Those planning to attend should notify the secretary, Dr. Talmage L. Peele, Box 3811, Duke Hospital, Durham, North Carolina.

News Notes

Dr. Harold B. Spangler has announced the opening of his office in Rocky Mount, North Carolina. His practice will be limited to infants and children.

Tennessee State Medical Association

The one hundredth and seventeenth annual meeting of the Tennessee State Medical Association will be held in Knoxville, April 7, 8, and 9, with headquarters at the Andrew Johnson Hotel.

Tri-State Medical Association

The fifty-third annual meeting of the Tri-State Medical Association of the Carolinas and Virginia was held in Roanoke, Virginia, February 18 and 19. Participating in the program from North Carolina were Dr. R. B. Davis of Greensboro, Dr. R. Burke Suitt of Duke University, Dr. Clyde M. Gilmore and Dr. Marvin E. McRae of Greensboro, Dr. R. L. Weinstein of Fairmont, and Dr. J. H. Neese of Monroe.

Officers of the Association include Dr. W. R. Wallace of Chester, South Carolina, president; Dr. James Asa Shield of Richmond, president-elect; Dr. J. F. Williams of Richmond, Dr. R. L. Crawford of Lancaster, South Carolina, and Dr. T. C. Bost of Charlotte, vice presidents; and Dr. J. M. Northington of Charlotte, secretary-treasurer.

Baylor University College of Medicine

A refresher course for medical technologists will be presented at the Baylor University College of Medicine, Houston, Texas, by the Department of Biochemistry, August 18-23. Application should be made to Dr. J. H. Gast, Department of Biochemistry, Baylor University College of Medicine, Houston 25, Texas, before August 1. Registration is limited, and only qualified medical technologists should apply. The fee is $25 ($10 payable with application). Requests for room reservation can be made with application. The Shamrock Hotel is offering a special rate of $12 per day for two, three, or four persons per room (single beds).

Industrial Health Conference

The 1952 Industrial Health Conference will be held at the Netherland Plaza Hotel in Cincinnati, Ohio, April 19 to 26. The conference will include sessions of the Industrial Medical Association, the American Conference of Governmental Industrial Hygienists, the American Industrial Hygiene Association, the American Association of Industrial Dentists, the American Association of Industrial Nurses, and the U.S. Navy Fourth Annual Industrial Health Conference.

American College of Radiology

The journal, **Radiology**, announced last month that a new compound had been developed for the radiographic visualization of the gallbladder and that clinical tests carried out so far showed that it was far superior to the opaque materials used in the past.

The new product will be marketed under the trade name, Telepaque, and is manufactured by Winthrop-Stearns Company.

United Cerebral Palsy Association, Inc.

To help relieve the acute shortage of physical therapists, United Cerebral Palsy announced recently that it had made a grant for $12,000 to the Physical Therapy School of Northwestern University, Chicago, to enable the school to continue its training of therapists for another year.

Foundation of the American Society of Plastic and Reconstructive Surgery, Inc.

1952 Essay Contest in Plastic and Reconstructive Surgery

The Foundation of The American Society of Plastic and Reconstructive Surgery offers awards in junior and senior classifications for original contributions in this field.

1. Junior Classification

Two six month scholarships in leading plastic surgery services in the United States, England and Italy. The contest is open to plastic surgeons in the specialty not longer than five years.

2. Senior Classification

Foundation's annual prize—Silver Plaque—for the best essay presented at the annual meeting of the American Society of Plastic and Reconstructive Surgery.

The winning essays, in both classifications, will appear on the program of the forthcoming annual meeting of the A.S.P. & R.S. to be held in New York City, November, 1952.

All entries must be received by the Award Committee not later than September 1, 1952.

Further inquiries should be addressed to:

The Award Committee
c/o Jacques W. Maliniac, M.D.
11 East 68th Street
New York 21, N. Y.

AMERICAN COLLEGE OF ALLERGISTS

On April 4, 5, and 6 at Pittsburgh, Pennsylvania, the American College of Allergists will offer an instruction course in allergy. To insure complete coverage, the college has called in some 60 well known authorities in the field to give addresses, clinical talks, and demonstrations. The program has been designed for physicians in other fields of practice, especially those in general practice, that they may learn to recognize and manage the allergic component in the complaints of their patients.

For further information and a copy of the program, write the office of the American College of Allergists, LaSalle Medical Building, Minneapolis 2, Minnesota.

* * *

The next annual meeting of the American College of Allergists will be held this year at the William Penn Hotel in Pittsburgh, Pennsylvania, on April 7, 8, and 9. The college is offering an unusually practical program for its fellows, members, and guests.

All reputable physicians are welcome to attend. For more particulars, write the College, LaSalle Medical Building, Minneapolis 2, Minnesota.

POSTGRADUATE COURSE IN OBSTETRICS

A postgraduate course in the form of an obstetric seminar will be held at the Sheraton Plaza Hotel in Daytona Beach, Florida, on September 8, 9, and 10, under the sponsorship of the Maternal Welfare Committee of the Florida Medical Association, and the Bureau of Maternal and Child Health of the Florida State Board of Health. Dr. Frances E. M. Read, director of the bureau, has extended an invitation to practitioners in North Carolina. Speakers who are outstanding in the field of obstetrics will participate in the program, which will consist of formal papers and round table discussions.

MUSCULAR DYSTROPHY ASSOCIATIONS OF AMERICA, INC.

Three new research grants in widely separated parts of the country were announced recently by the Muscular Dystrophy Associations of America. This brings the total of research projects initiated and supported by the Association to nine, all created within the past year, according to Michael E. Freelund, executive director.

Among the recent grants was one to Dr. W. F. H. M. Mommaerts at Duke University, for the study of micromethods in the investigation of muscular metabolism.

(BULLETIN BOARD CONTINUED ON PAGE 164)

AUXILIARY

TWENTY-NINTH ANNUAL MEETING OF THE

AUXILIARY TO THE MEDICAL SOCIETY OF THE STATE OF NORTH CAROLINA

PROGRAM

SUNDAY, MAY 4, 1952

8:00 P.M.—Memorial Service for departed Medical Society and Auxiliary Members—Ball Room—Mrs. H. Stuart Willis, Chairman, Auxiliary Memorial Committee

MONDAY, MAY 5, 1952

8:00 P.M.—Executive Board Meeting—Dutch Room

8:30 P.M.—Bingo Party—Large Card Room—One Dollar for evening. Any money left after expenses will be divided among the Sanatoria Bed Endowment Funds. Men Welcome! Mrs. George Heinitsh, Chm.

TUESDAY, MAY 6, 1952

9:00 A.M.—House of Delegates of Medical Auxiliary—Pine Room

11:00 A.M.—Coca-Cola Intermission

11:30 A.M.—Annual Meeting of Medical Auxiliary—Pine Room

1:00 P.M.—Luncheon, Pinehurst Country Club (Honoring Mrs. Leo Schaefer, Salina, Kansas, First Vice-President of the Auxiliary to the American Medical Association; Mrs. Stanley Hill, Corinth, Mississippi, Vice-President of Southern Medical Auxiliary) Mrs. Michael Pishkoe, Chairman, Fashion Show, Mary Rice Shop, Hamlet.
Informal Reception immediately following luncheon

7:00 P.M.—President's Dinner—Carolina Hotel Dining Room

10:00 P.M.—Annual Ball—Ball Room

WEDNESDAY, MAY 7, 1952

9:00 A.M.—Breakfast—Stag Room—Medical Auxiliary Executive Board Members and County Presidents

10:00 A.M.—Bridge and Canasta Party—Large Card Room—Mrs. R. L. McMillan, Chairman

Conference Urges Constructive Program Now For Aging Workers

Government and industry were urged to discard the economically-wasteful and socially harmful policy of compulsory employee retirement at age 65, and to begin planning now a constructive program to deal with the growing problem of older workers.

The recommendation was made by a group of 75 experts in industrial relations, medicine, labor and education at the close of a three day conference on the nation's aging population. Dr. Theodore G. Klumpp, president of Winthrop-Stearns, Inc., was chairman of the conference which was held at Arden House on January 25-27. Sponsors were the McGregor Fund of Detroit and the National Committee on the Aging of the National Social Welfare Association.

The conferees agreed that retirement solely on the basis of age was socially wasteful, and that "older persons willing and able to meet job requirements could make a positive contribution to the national economy." The country is now losing the potential labor of 1,500,000 persons who could earn $4,500,000,000 a year, according to Dr. Thomas Parran, dean of the Graduate School of Public Health at the University of Pittsburgh.

BOOK REVIEWS

Annual Report on Stress. By Hans Selye. 511 pages plus references. Price, $10.00. Montreal, Canada: Acta, Inc., 1951.

As indicated on the title page, this volume represents the first of a series of annual supplements to the book **Stress—The Physiology and Pathology of Exposure to Stress** by the same author. This volume reviews the stress concept in 1951, and summarizes the objections raised against the concept. He then reviews the new material which accumulated during the year with reference to the concept. This material is classified under the headings: the stressor agents; the adaptive hormones; special physiology and pathology of systemic stress; metabolism (carbohydrates, proteins, fats, water, electrolytes, hormones and hormone-like substances, enzymes, vitamins, hemoglobin, glutathione, metabolic diseases of adaptation); and morphologic and functional changes in various organs (the endocrines, skeletal system, the blood and hemopoietic systems, cardiovascular system, kidneys, respiratory system, muscular system, nervous system, sense organs, gastrointestinal system, skin, inflammation, reticuloendothelial system, serologic reactions, wound healing, and so forth).

The organization of the book parallels that of the original volume in order to facilitate following up new developments in specific fields. In addition, the book is well indexed; approximately 3,300 references are listed in this volume.

The author closes the volume with a brief summary in which he presents his concept of a unified theory of medicine. The book will be of interest particularly to those who have purchased the initial volume and wish to keep up with the developments in this concept.

Doctors in Blue. By George W. Adams. 253 pages, with 16 illustrations. Price, $4.00. New York: Henry Schuman, 1952.

This is a fine book. It covers the general development of the medical service of the Union Army during the War Between the States, and then treats specialized facets such as surgery, hospital arrangements, nursing services, sanitation. All this is accomplished with a minimum of footnotes and in a readable narrative style. The reviewer has done enough prodding around in the references of this period to realize the enormous amount of work and critical judgment required to make a coherent story out of the mass of available fact. Dr. Adams, a professional historian, shows a rare appreciation of what is significant medically in his material, and a balanced point of view regarding the state of medicine in the 1860's, which is often lacking in modern lay writings dealing with the period.

It will be hard to find a physician, whatever his specialty or degree of interest in history, who would not enjoy this book. The War Between the States saw the last wholesale production of traumatic injuries before the advent of antiseptic techniques and the bacterial theory of disease. As Dr. Adams says, "The briefest review of surgical procedures in the dressing stations and field hospitals shows such a gulf between the methods of that day and the aseptic routine of our own that centuries, not a mere two generations, might well have separated 1865 and 1914." Except for ether and chloroform anesthesia, fortunately in wide use before 1861, and the abandonment of cauterization in the wake of Ambrose Pare, there was little but a change in mechanical handling due to the great size of armies offered to the wounded in 1865 that was not available to those who fell in the Roman legions.

Dr. Adams' work will be enjoyed widely outside of the medical profession, and can be recommended as sufficiently nontechnical for a general audience without stooping to "popularization." There are a few medical comments which the reviewer would take exception to, but they are scarcely worth noting, and it is hoped that the book will go into a second edition to permit their correction, more in the interest of the book than the corrections. The list of sources, appendix, and index add considerably to the value of the book.

Hippocrates on Intercourse and Pregnancy. Translated by Tage U. H. Ellinger, Sc. D. M.A., Professor of Zoology and Genetics of the University of Philippines. With an Introduction and Notes by Alan F. Guttmacher, M.D., Associate Professor of Obstetrics, Johns Hopkins University. 128 pages. Price, $2.50. New York: Henry Schuman, Inc., 1952.

The author of the original Greek treatise was not, we are told in the foreward, the great Hippocrates of Cos, but some other Greek physician of the rival Cnidian school. This little volume is interesting chiefly because of the quaint mixture of observation with unbridled imagination which was used in the theories of impregnation of the female and of the growth and development of the fetus.

The translator has done an excellent job, and so has the printer; but, even in these days of inflated currency, $2.50 seems a high price for such a small book.

Classified Advertisements

General surgeon, native of North Carolina, would like location in town of 10,000 or more after July 1st. Four years of fully approved training in 850-bed hospital, with experience in thoracic surgery and oncology. Board eligible. Aged 31, married, 2 children. Interested persons write MS-O-1, P.O. Box 790, Raleigh, North Carolina.

WANTED:

Young physician under thirty-five, military exempt for one year, to become associated with well established physician to do general practice. Ninety per cent of the work in office and hospital. Would prefer someone who is interested in internal medicine. Salary in the beginning and percentage basis later. Reply to 30-2, P. O. Box 790, Raleigh, N. C.

Dr. S. P. Watson, an Eye, Ear, Nose and Throat Specialist in New Bern, N. C., would like to have a younger man come in with him or take over his office. Reply: Dr. S. P. Watson, Box 588, New Bern, N. C.

"To an M.D. that will assume the balance of my lease of three months, I will turn over my ground floor office of three nice rooms. Nothing to sell. I plan to leave this city the last of April, 1952. Population 25,000." Reply 1-5, P.O. Box 790, Raleigh, N. C.

BULLETIN BOARD

(CONTINUED FROM PAGE 162)

AMERICAN COMMITTEE ON MATERNAL WELFARE

A two year contest to promote research on the so-called "toxemias of pregnancy" has been announced by the American Committee on Maternal Welfare, Inc. The contest is open to students and personnel in the health professions who are not of higher academic rank than instructor, or who are of junior rank on the hospital or other staff with which they are connected.

Dr. Fred L. Adair, president of the committee, stressed that all theses must be based upon original work done by the authors, and must be submitted no later than January 1, 1954. First and second prizes of $500 and $250, respectively, will be awarded later in 1954 at the Sixth American Committee on Maternal Welfare. All theses submitted will become the property of the committee.

The research contest was announced in advance of the fifth American Congress on Obstetrics and Gynecology, which will be held in Cincinnati, March 31 through April 4, 1952. During this meeting a comprehensive summary will give all progress and knowledge to date concerning the causes and treatment of the "toxemias."

AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY

More than 2,500 physicians and nurses are expected to attend the fifth American Congress on Obstetrics and Gynecology, to be held in Cincinnati's Netherland-Plaza Hotel March 31 through April 4. It is sponsored by the American Committee on Maternal Welfare.

The program will bring up to date all scientific and clinical aspects of obstetrics and gynecology. In addition to this comprehensive medical program, there will be papers on nursing and public health, and a special session on sociologic factors.

AMERICAN LIBRARY SERVICE

The American Library Service is in possession of an exceptional collection of reprints of important articles that have appeared in medical journals (many with limited circulation) during the past 60 years. Since this material is no longer available through the usual channels of purchasing, it should prove to be of interest to the individual specialist, to the hospital or university library, and to the research student and historian.

The collection was assembled at great effort over a period of many years. Since it includes significant contributions to medical literature which are not readily available, it has been decided to break up the collection and offer its component parts at a nominal figure. A list of available items will be furnished at no obligation on request. Address the American Library Service, 117 West 48th Street, New York 19, New York.

COMMONWEALTH AND EMPIRE HEALTH AND TUBERCULOSIS CONFERENCE

The Commonwealth and Empire Health and Tuberculosis Conference will be held in London, England, July 8 to 13. The Conference is open to all those interested in preventive medicine, including the medical and veterinary professions, commercial and industrial executives, nurses, public health administrators, and the like. At the last Conference held in 1949 over a thousand delegates from 50 countries were present. Subjects for discussion include "Protective Vaccination," "Contemporary Ideas in the Management of the Tuberculous Patient," "The Patient in Industry," and others. A new feature this year will be special smaller gatherings for those with a particular interest, whether doctors, nurses, public health officials, or social workers, at which appropriate subjects will be discussed.

All information can be obtained from the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1.

FEDERAL SECURITY AGENCY

Public Health Service

A competitive examination for appointment of medical officers to the Regular Corps of the United States Public Health Service will be held on June 3, 4, and 5, 1952. Examinations will be held at a number of points throughout the United States, located as centrally as possible in relation to the homes of candidates. Applications must be received no later than April 30, 1952.

Application forms and additional information may be obtained by writing to the Surgeon General, United States Public Health Service, Federal Security Agency, Washington 25, D. C. Attention: Division of Commissioned Officers.

Applications received after April 30, 1952, can not be accepted.

* * *

The Federal Security Agency recently announced the appointment of Dr. Calvin B. Spencer as Chief of the Division of Foreign Quarantine, U. S. Public Health Service, and Dr. Gilbert L. Dunnahoo as Chief of Medical Programs, FSA Region X, San Francisco. The appointments have been made by the Surgeon General of the Public Health Service, Dr. Leonard A. Scheele.

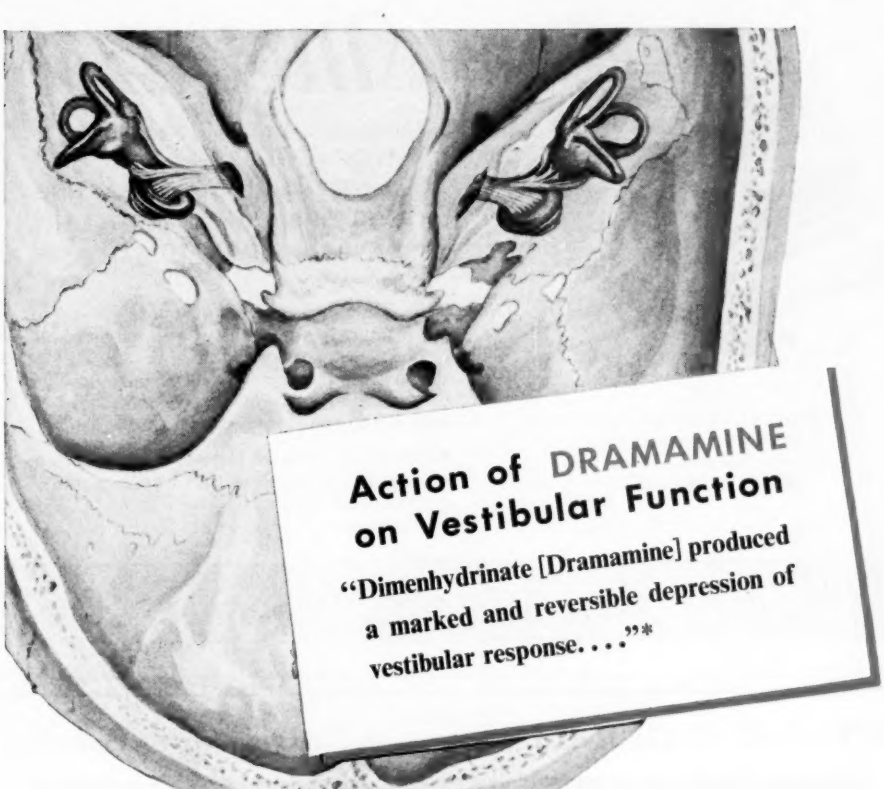
As Chief of Foreign Quarantine, Dr. Spencer heads the agency responsible for preventing the importation of infectious diseases into the United States and for the medical examination of aliens requesting admission into this country. The Division operates 243 stations at seaports, airports and points of border crossing in the United States and its possessions. Offices are also maintained at 24 United States embassies and consulates. During the past fiscal year, ending July, 1951, more than 31 million persons were checked by Quarantine; 28,000 planes and 20,000 ships were inspected. Not one single case of a quarantinable disease was imported into the country.

As Chief of Medical Programs for FSA's Region X, Dr. Dunnahoo will be responsible for programs on tuberculosis control, venereal disease, heart disease, cancer, environmental health, and public health nursing, which are now being operated in cooperation with the states and territories. Region X includes California, Arizona, Nevada, Oregon, Washington, Hawaii and Alaska.

VETERANS ADMINISTRATION

The appointment of Dr. George Marshall Lyon, founder and director of the extensive radioisotope program in Veterans Administration hospitals, as Assistant Chief Medical Director for Research and Education, was announced February 5, 1952 by Carl R. Gray, Jr., Administrator of Veterans Affairs.

Dr. Lyon replaces Dr. E. H. Cushing, who resigned March 1. Dr. Lyon was senior research assistant to Dr. Cushing.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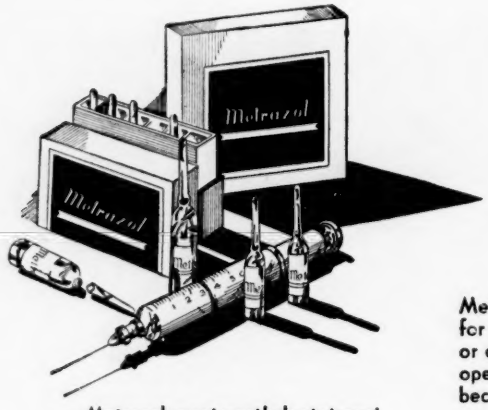
ACCEPTED COUNCIL ON PHARMACY AND CHEMISTRY AMERICAN MEDICAL ASSOCIATION

*Gutner, L. B.; Gould, W. J., and Batterman, R. D.: Action of Dimenhydrinate (Dramamine) and Other Drugs on Vestibular Function, Arch. Otolaryng. *53*:308 (March) 1951.

RESEARCH IN THE SERVICE OF MEDICINE SEARLE



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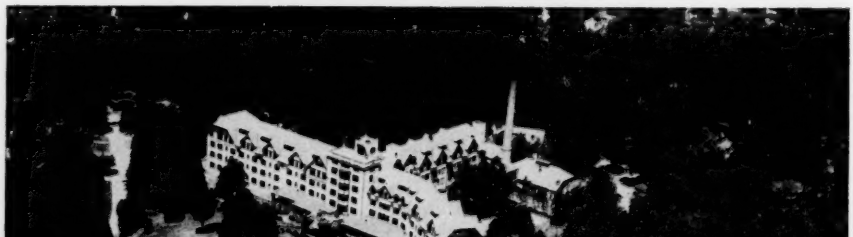

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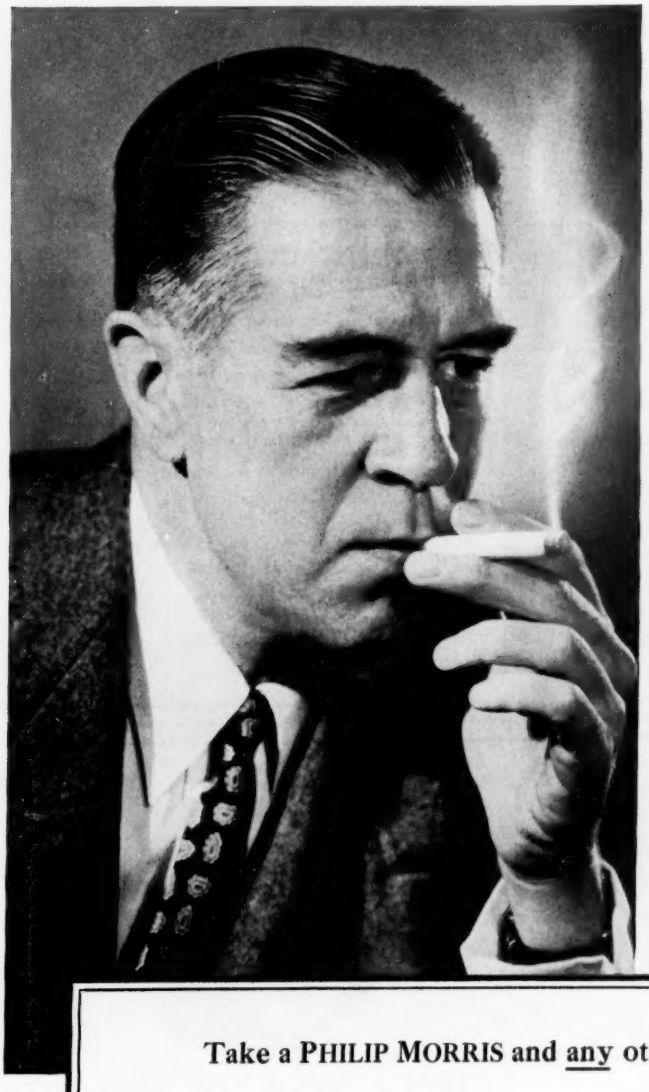

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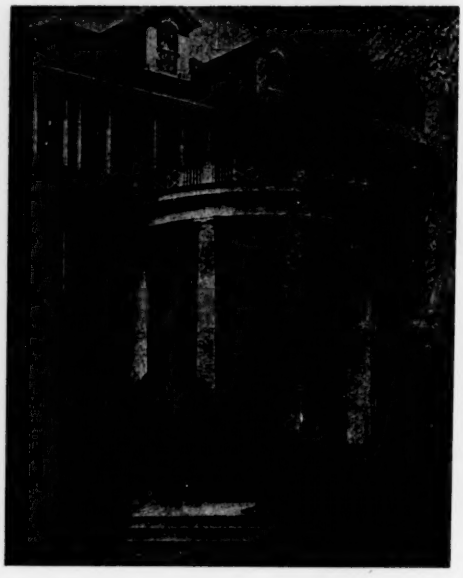

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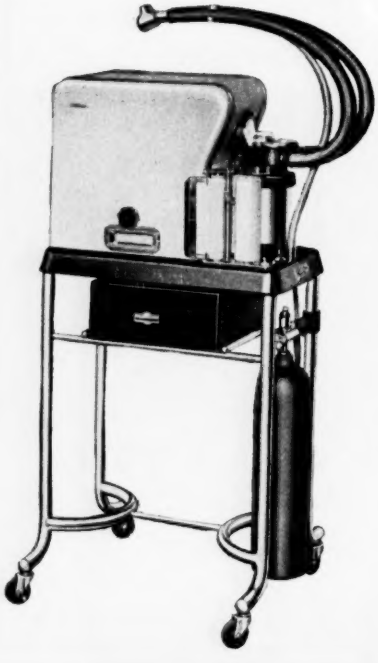

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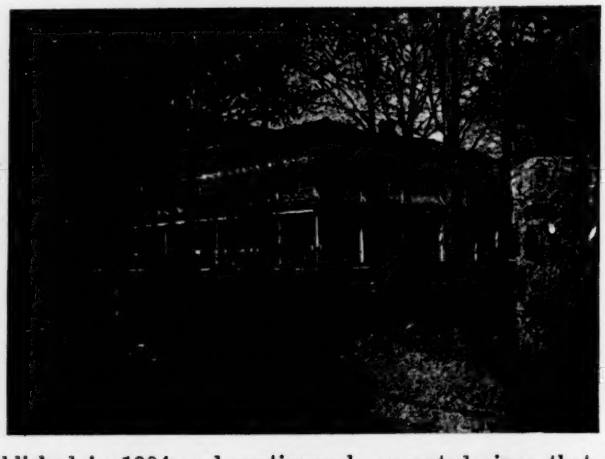

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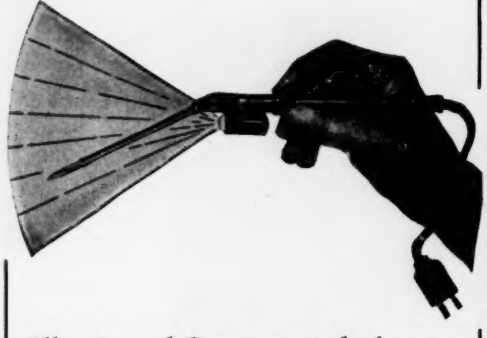

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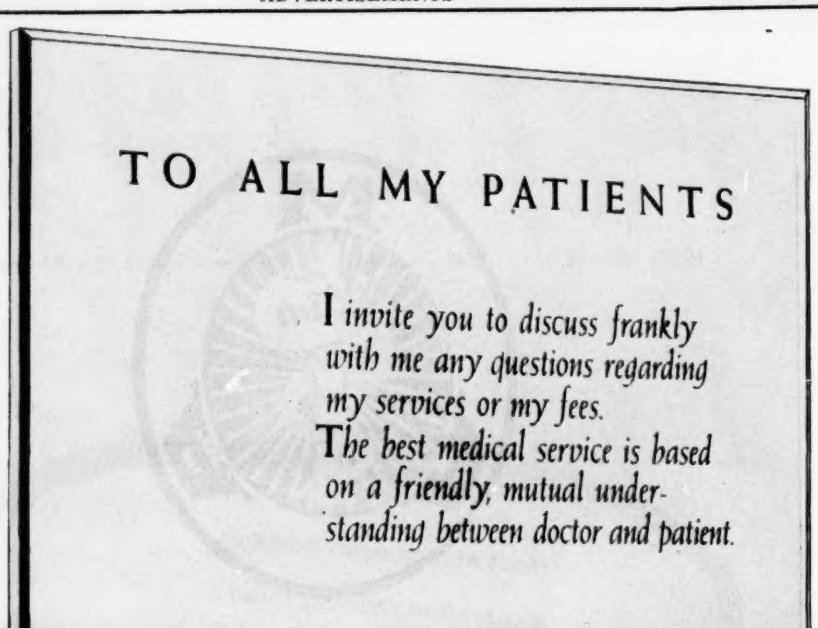
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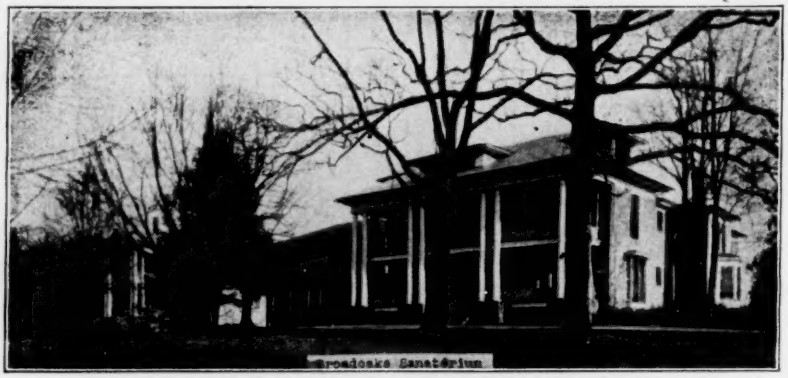

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Vasoconstriction — to which the visual prodromata are attributable. It is possible to abort the attack during this phase in all but a few cases. (See treatment below.)

Vasodilatation — as the vessels lose their tone, exaggerated pulsations set in, resulting in the throbbing pain which characterizes vascular headache. Treatment for the attack is still effective during this phase. (See below.)

Vessel Edema — if the vasodilation continues for too long, vessel walls become edematous; this changes the character of the pain to a steady, intense aching. The attack can now no longer be checked, even with maximum dosage of specific drugs. *Moreover, sustained headache often induces reflex neck muscle tension, a source of residual pain.*

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GENERAL REFERENCES: DeJong, R.: Chicago M. Soc. Bull *54:* 106, 1951. Friedman, A.: Modern Headache Therapy, St. Louis, C. V. Mosby Co., 1951. Wolff, H.: Headache and Other Head Pain, N. Y., Oxford Univ. Press, 1948.

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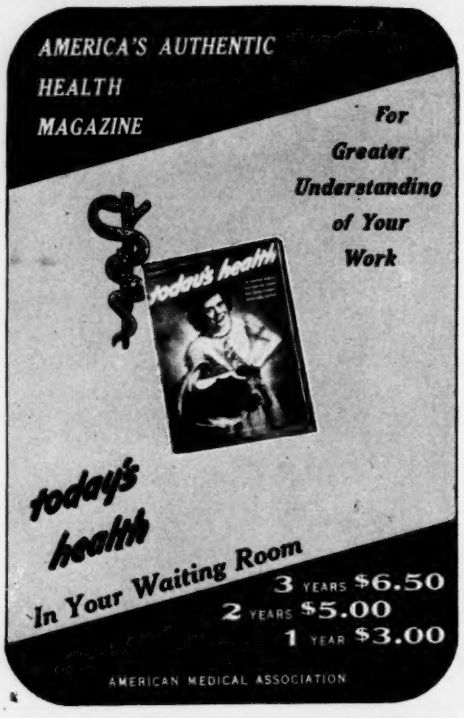

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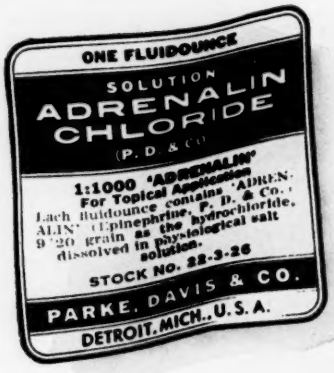
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(epinephrine, Parke-Davis)

the first

hormone to be isolated in pure crystalline form

the first

American antihistaminic

Benadryl® HYDROCHLORIDE

(diphenhydramine hydrochloride, Parke-Davis)

Theelin

(ketohydroxyestratriene, Parke-Davis)

the first

crystalline estrogenic substance

Chloromycetin®

(chloramphenicol, Parke-Davis)

the first

and only antibiotic synthesized on a practical scale

The Parke-Davis label, known and relied on the world over, is a respected symbol in research, in clinical investigation, and in quality production.

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MICHIGAN

In infant formulas...

proper

caloric

distribution

calls for

adequate added carbohydrate

FREQUENT mention in authoritative pediatric literature supports the classic caloric distribution of 15% protein, 35% fat and 50% carbohydrate for infant formulas.

This assures ample protein for development of sound tissue structure. And it supplies *adequate carbohydrate* to spare protein for its essential functions, meet energy needs, promote good fat metabolism and maintain water balance.

This classic caloric distribution is conveniently represented by 1 part evaporated milk and 2 parts water with 5 per cent added carbohydrate—roughly 1 tablespoon of Dextri-Maltose to each 5 ounces of formula.

For over 40 years, milk and Dextri-Maltose formulas with these approximate proportions have enjoyed consistent clinical success.

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EVANSVILLE 21, IND., U. S. A.